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The Michigan Car Demurrage Supervising Bureau has now been in operation about four months, and the results have been satisfactory. Agents are giving more systematic and efficient attention to the collection of demurrage, and at many of the stations the number of delayed cars has been reduced. The railways of Michigan decided to abolish the car demurrage bureau and to establish this supervisory organization instead, largely because the need for a joint bureau to attend to collections no longer exists. The more general recognition of and compliance with uniform rules, and the promulgation of interpretations by the Interstate Commerce Commission, which have necessitated the strict management of the business of charging demurrage at all stations, have abolished or greatly simplified most of the perplexing questions formerly arising, and have opened the way for a restoration of the normal method, having each local freight agent make the collections in his own territory, the same as he collects freight bills. The supervising bureau employs five outdoor supervisors who are constantly traveling from station to station

instructing the agents and making careful inspections of their records. The "lost motion," due to the employment of special checkers or special collectors at numerous stations to attend to the demurrage records and collections and nothing else, has been done away with; while at the same time it is practicable by the employment of competent inspectors for the central office to know, quite as fully as before, how the business is conducted.

An incident of the kind that bring public service corporations needless unpopularity occurred in Chicago recently. An accident on one of the elevated railways tied up its traffic during the evening rush hour. A city officer who was delayed at one of its stations demanded the return of the fare he had paid. The agent at first refused. A quarrel ensued, in which the other passengers, of course, backed the city official; and, finally, all their fares were refunded. The result has been the starting of an agitation in the press to force the various lines handling city and suburban traffic to comply with an ordinance requiring them to return fares within ten minutes after an accident has occurred which stops operation. The president of one of the elevated railways has given an interview to the newspapers, in which he says that its agents are required to return fares within fifteen minutes after such a delay if passengers demand it. It is perfectly clear, however that the company is entirely in the wrong. Everyone who uses it knows that its agents never refund fares except after unnecessarily long delays and most insistent demands. This is in violation of the spirit, if not the letter, of the city ordinance. It is also in violation of good policy from the standpoint of the railway itself. For its own good it ought, when such a delay as is specified by the ordinance occurs, to have its agents and guards voluntarily announce to all waiting passengers that they can get their money back. Its course in keeping all the fares it can without rendering value received for them, and in withholding as long as it can even those which it finally returns, makes critics and enemies of thousands of its patrons from whom it never receives complaints directly, but from whom it does hear indirectly in the form of opposition to every concession and franchise which it seeks at the hands of the public. What it loses indirectly in cash greatly exceeds what it gains directly in cash by keeping money that it ought promptly and voluntarily to return. Railways and other public service corporations are issuing a great deal of literature nowadays entreating the public to give them a "square deal" and telling people why it is to their interest to do so. These appeals and arguments are deprived of much of their proper effect by constant infraction by many public service corporations of their own duty to give the public a "square deal."

The accident bulletin issued by the Interstate Commerce Commission for the last quarter of 1909, the principal part of which is reprinted in this issue, is characterized not only by large totals, indicating the increased stress under which train operations are carried on under a greatly enlarged volume of business, but also by an unusual variety of those lessons which are given in these bulletins in the shape of detailed statements of the facts of the most disastrous collisions and derailments. Perhaps the most significant of these lessons is that given in the last paragraph, that giving the cause of derailment No. 4—an unstable tender. Derailments of tenders which are top-heavy or improperly loaded or not well designed have become altogether too familiar within the past few years. In this case the manager of the road on which an accident of that kind appears to have happened was frank enough to put into his report a lucid statement of his honest opinion. The most disastrous derailment in the bulletin (No. 12) has only five lines of explanation. This evidently was the accident at Greensboro, N. C., December 15, reported in the *Railway Age Gazette* February 11, page 297. The first collision of which

the details are given (No. 2) occurred under controlled manual block signaling—a system which now is in use on but few railways. Collision No. 10 must be the one which occurred October 9 at North Topeka, Kan., reported in the *Railway Age Gazette*, page 135. The statement concerning collision No. 12, which occurred at Jersey City, November 6, contains no facts beyond those already reported, except the statement that the road has taken measures to prevent similar accidents in the future. Collision No. 15, in which five persons were killed and 14 injured, occurred under circumstances showing the value of having switches properly interlocked, with levers concentrated in a cabin and with a single person (in the cabin) in sole control of switching and signaling operations. Collision No. 20 once more enforces the old lesson that most trainmen have to learn some of the simplest features of their work in the hard school of experience. In this case a brakeman of seven months' experience, sent out to flag a passenger train, allowed that train to get past him. He had been on duty about 17 hours, and a popular explanation of his failure would be that he was overworked. Railway men will say, however, that the trouble was not that he was sleepy, but that, when sitting down to rest under circumstances in which he might possibly fall asleep, he neglected the simple precaution of placing his red light in a position where it would be seen from the approaching train, whether he were awake or not. The paragraph concerning collision No. 27, that at Parnell, Ill., October 5, gives details in addition to those which were published in our account of the accidents of that month in our issue of December 10, page 1135. Collision No. 31 occurred at Lind, Wash., November 25, and was reported in the *Railway Age Gazette*, page 1230. The government statement gives some circumstances not shown in our report, but the accuracy of the statement ascribed to the engineman seems open to question. Here again was a case of a man who had been on duty over 16 hours, yet his error occurred under circumstances in which he must have been awake.

ELECTRIC HEADLIGHTS.

The action of the Indiana Railway Commission ordering the railways of that state to equip all locomotives in road service with high power headlights by July, 1911, is being contested by the roads in the courts and is causing the merits and demerits of electric headlights to be more closely investigated than ever before. The order does not specify the electric light, but it requires the lamps to have 1,500 candle power, which, in the present state of the art, is only met, it is believed, by the electric arc light. Electric headlights have been used on locomotives for 15 years and nearly 13,000 of them have been sold by one manufacturer, principally to the lines in the south and west. The states of Texas, Arkansas, Georgia, North Carolina, Missouri, Washington and Montana already have laws requiring their use, and the majority of the locomotives operated in Texas are now equipped. A number of the western trunk lines are using them, one having as many as 1,100 and seven or eight of them as many as 500 each.

Before issuing the order, W. J. Wood, chairman of the Indiana Commission, requested Prof. C. H. Benjamin, of Purdue University, to conduct some experiments to determine the relative effect of oil and electric headlights upon the reading of signals and the identification of obstacles on the track. The substance of Prof. Benjamin's report is given in his paper read at the last meeting of the Western Railway Club, a full abstract of which is published in our issue of April 22, 1910, page 1038. The paper is entirely unfavorable to the electric headlight. The author concludes that it is a disadvantage to the engineer and fireman to have an electric headlight on the engine, as it interferes with the correct reading of signal lights; that it is a still greater disadvantage to them to meet engines equipped with electric headlights on parallel tracks; and that the greater illumination of the track does not compensate for the disadvantages mentioned.

The railways have spent large sums of money in equipping locomotives with this device. It will be inquired why they have done so if competent and careful tests show it to be disadvantageous to the very men whom it was intended to benefit. A full reply to this question will be found in the abstract of the discussion on Prof. Benjamin's paper, which is published on another page of this issue. In discussing a question of this kind the surrounding conditions should be considered and general statements which lead to confusion and error should be avoided. When these conditions are taken into account it will be found that there are places where the high power headlight is desirable, and others where it is objectionable. On the single track lines in the south and west, which are poorly provided with signals and switch lights and where more obstructions, such as fallen trees, cattle, etc., get on the track, electric headlights have been found a protection against danger. The engineers on those lines prefer them to the oil light, and it is on account of their recommendation that they have been so largely introduced on single track lines. In the more densely settled eastern part of the country, where most of the lines have double track well protected by signals, and where obstructions on track are much less frequent, the high power headlight is not necessary, and it may be objectionable to some extent in the ways pointed out by Prof. Benjamin. In some of the states in the middle west, like Ohio, Indiana and Illinois, the conditions are not so easy to define as are those in the regions already mentioned. In those states there are lines having double track and many others with single track and numerous branch lines with few signals. While the electric headlight might be an advantage on some portion of these lines, it is not necessary and may be objectionable on other lines in the same state.

A safety appliance of this kind which is not generally useful and necessary should not be made the subject of a state law or of an order of a railway commission; and the railways are justified in contesting such laws or orders as an unreasonable exercise of the state's police power. It should not be necessary for them in defense of their case to show that the electric headlight is as objectionable as is claimed in Prof. Benjamin's paper. It ought to be sufficient to show that high power lights are not necessary in regions where there are multiple tracks protected by signals, and that a general order covering all lines in a state is unduly burdensome and expensive in proportion to the benefits that can be expected to be derived from it. Legislation and requirements relating to railway safety appliances may result in the public good when they are intelligently drawn and sensibly enforced, but many recent enactments and orders are so unreasonable that the railways are compelled to resort to the courts for the protection of their ordinary property rights.

NEGOTIATIONS WITH LABOR LEADERS.

The more than three months of negotiation and arbitration between the railways and their employees have been conducted in dignified fashion, with the firm determination on the part of the railways, at all hazards, to avoid strikes. This disadvantage in position has been due to the belief that public sentiment would support the strikers rather than the railways. The railways have been sinners, not in wage paying, but in other respects. A bad conscience, although concerning transactions of long ago, makes a bad stomach to fight on.

The result is an increase of millions to be paid in wages to train crews, switchmen, yardmen, telegraph operators and others, already, in the aggregate, overpaid, and these millions will in the natural course be paid by the "ultimate consumer." There is no question of the final result, that the bondholder and stockholder will not share the loss with those who pay the fares and the freight. Public opinion wavers, but its final judgment is fair.

In the East, the leaders of the conductors' and trainmen's

organizations are working on one main plan: To put wages on a uniform mileage basis on all roads in eastern territory; that is, west of Chicago and north of the main line of the Chesapeake & Ohio. Their first intention was to make the western scale apply. They began negotiations with the Baltimore & Ohio because, as they frankly admit, that road already paid the highest unit rates. The question was left to mediation under the Erdman act and the companies and employees accepted the decision, which put pay on a mileage basis but made the rates lower than the western scale. The labor leaders, therefore, modified their original plan and it is this Baltimore & Ohio scale which they are now working to make uniform.

Their argument for uniformity is that a man ought to earn as much in the East as in the West, and that the railways by putting their statistics of operation on a mileage basis show that they consider mileage to be the basic unit in railway operation. The fallacy of this argument has been frequently pointed out. The Baltimore & Ohio rates per mile before the recent settlement, although much higher than those of the New York state trunk lines, did not result in as much monthly pay as on at least some of the New York state roads. The following table gives the minimum, maximum and average monthly pay of one road under the present scale. The figures apply only to men who worked 20 days or more during the month. Figures taken from the actual payroll of the same company for a month give averages in general slightly lower, because the payroll includes, of course, men who work a very few hours per month:

	Minimum.	Average.	Maximum.
Passenger conductors	\$90	\$124.69	\$144.00
Passenger brakemen	60	68.94	77.50
Freight conductors	90	109.22	120.00
Freight brakemen	63	74.26	90.00
Baggagemen*	60	69.64	82.00

*Also receive an average of \$10 per month in addition, paid by express company for handling express.

The above figures, showing the high wages already paid by a road whose rates if expressed in cents per mile are much lower than those of the Baltimore & Ohio, is the obvious answer to the labor leaders' argument that the way to make wages uniform is to make uniform mileage rates. What is also to be considered is the fact that they are not taking into account the character of service on different lines. They ask all companies to pay the same wages, whether it be on a road a great part of whose mileage is not block signaled and where the trainmen have to get orders, throw switches, etc., or on a road where the block signal mileage predominates and all such work is done by signalmen or employees other than conductors and trainmen.

We have used the term "labor leaders" in the foregoing because we meant that and not employees. The way so-called "strike votes" are taken is an indication as to how much the employees themselves really know about what is going on. After a conference with railway officials the labor leader issues a circular to his men: "The railway offers an increase of 6 per cent. This would make the rate \$6 for the run from — to —, 150 miles. The Baltimore & Ohio scale would give you \$8 for this run. If the schedule we ask is not granted, we intend to ask you to leave the service of this company. If you are opposed to this you are to communicate in writing with the undersigned." This makes it hard for the conservative man to vote against the strike. It puts the initiative on him; he has to write and give his reasons and get in the lime-light. The labor leader gives in such a circular only such instances of the effect of an increased rate as will indicate to the men the greatest advantages to be gained from the proposed scale. The returns from this circular are reported by the labor leader as a vote. Taking the very few negative replies which such a circular brings out, and counting all other members of the union as voting in the affirmative, it is not surprising that the result of the strike "vote" is "97 per cent. in favor of the strike."

WHAT IS THE RATE-MAKING POWER OF THE INTERSTATE COMMERCE COMMISSION?

For ten years after the original Interstate Commerce Act went into effect the Interstate Commission issued orders fixing railway rates. In 1897 the Supreme Court of the United States, in the Maximum Rate cases, held that in doing so it had exercised a power it did not legally have. The Interstate Commerce Act, as amended, has been in effect almost four years. Throughout this time the commission again has been exercising a power over rates which it probably does not legally possess. The act gives it a restricted authority to fix rates. There is not much doubt that the provisions conferring this authority are constitutional. But many of the orders the commission has been issuing seem open to successful attack on the ground that in making them it has disregarded and overstepped the limits fixed by Congress on its authority.

Section 15 of the Interstate Commerce Law, as amended, authorizes the commission, "whenever, after full hearing and complaint," it "shall be of the opinion that any of the rates, or charges whatsoever, demanded, charged or collected by any common carrier or common carriers, subject to the provisions of this act * * * are unjust or unreasonable, or unjustly discriminatory, or unduly preferential or prejudicial, or otherwise in violation of any of the provisions of this act, to determine and prescribe what will be the just and reasonable rate or rates, charge or charges, to be thereafter observed in such case as the *maximum* to be charged; * * * and to make an order that the carrier shall * * * not thereafter publish, demand or collect any rate or charge for such transportation in excess of the *maximum* rate or charge so prescribed." This gives the commission authority to reduce a rate either because it is (1) discriminatory or (2) unjust or unreasonable—that is, excessive. It is in the exercise of its authority to reduce rates for the second reason mentioned and to substitute reasonable maximum rates, that it is believed the commission is going too far.

The language in which the law confers on the commission power to condemn excessive and substitute reasonable rates is given two interpretations. One is that it makes the commission, as to rates about which complaint is made, virtually the traffic manager of the railways. The commission, according to this interpretation, may and should substitute its judgment of what such rates ought to be for that of the managers of the railways; and so long as it does not cross the deadline of confiscation it may readjust and reduce them as it pleases. The commission has not in any opinion expressly adopted this interpretation. But it has adopted it by its acts. For example, in the Missouri River Jobbers' case, now pending in the Supreme Court, it substituted its judgment for that of the traffic managers as to whether rates should break at certain basing points. It adopted the principle that the through rate ordinarily should be less than the sum of the local rates, and condemned the class rates between the Mississippi and the Missouri rivers, not because the evidence showed that, measured by the cost or the value of the service, they were excessive, but because they conflicted with its new principle of rate-making. Innumerable other instances could be cited where it has thus substituted its judgment for that of the traffic managers. In the very recent decision in Laning-Harris Coal & Grain Company versus C., B. & Q. (I. C. C. opinion No. 1169), it ordered the rate on anthracite coal from Chicago to Akron, Colo., reduced for no reason, apparently, but that the Burlington had made a rate from Chicago to Haigler, Neb., which was less per ton per mile, in spite of the fact that witnesses for the Burlington testified that they did not regard the rate to Haigler as remunerative, and that it had been produced largely by rates fixed by the Nebraska legislature, which are being tested in the courts. Again, in the case of Acme Cement Plaster Company versus C. G. W., et al. (I. C. C. opinion No. 1173), the commission ordered reductions in the rates on plaster from

Gypsum and Council Bluffs, Iowa, to various points in North and South Dakota. The complainants alleged unfair discrimination. The commission ruled against this allegation, and reduced the rates for no reason seemingly, but that they were higher proportionately than those made by the roads concerned on some other commodities. The fact that some of the reductions were but 2 cents per 100 lbs. shows that the commission is substituting its judgment for the discretion of the traffic managers as to minute details of their duties. The most experienced and acute traffic man would hesitate to say positively, as the commission did, whether 15 or 13 cents was the exact rate which would be most reasonable on cement plaster from Council Bluffs to Canton, S. D.

The other interpretation of the Interstate Commerce Act grants it power only to fix the highest limit up to which the traffic managers may exercise the discretion which the law leaves them. The lowest rate a railway can justifiably accept is one which will a little more than cover the expense which the handling of the traffic to which it applies adds to the other expenses of operation. The highest rate it can justifiably charge is one which falls a little short of the value of the service which it renders to the shipper. Sometimes the least for which the railway could afford to take the traffic is a little more than the most the shipper could afford to pay. Then the traffic cannot move. But usually between the maximum which the railway can charge without extortion and the minimum which it can accept without loss there is a substantial distance. Under the interpretation of the law we are now outlining the determination of the point at which between these limits any specific rate shall be fixed is, so long as there is no unfair discrimination, entirely within the discretion of the traffic manager. When a complaint is filed, the commission's first duty is to ascertain if the rate complained of exceeds this highest limit; in other words, is extortionate. If the commission finds that it does not, its duty is done. If it finds that it does, its duty is to fix, not the rate which it may think that the traffic manager ought to make for the greatest good of both the railway and the shipper, but merely the highest rate which will not be extortionate.

In view of the discussion of the Hepburn bill in Congress, its language as passed, and decisions of the Supreme Court, it seems probable that the second interpretation which we have outlined is the correct one. It was proposed in Congress to give the commission power to fix absolute rates. It was also proposed to give it power to fix minimum as well as maximum rates. Both these propositions were rejected. It was given power only to fix maximum rates. It cannot be assumed that Congress intended the railways should make any rates unreasonably low. Yet its idea in giving the commission power only to fix maximum rates was that the railways probably would make rates lower than those fixed by the commission. It must follow that Congress meant that the commission should fix not the exact rate which, in its judgment, the railway ought to make, but the rate more than which the railway could not charge without extortion.

The belief that this is all Congress meant to do, did, or, perhaps, could do, receives strong support from decisions of the Supreme Court. In one case (173 U. S. 684), it said:

"What the (railway) company may choose voluntarily to do furnishes no criterion for the measurement of the power of the legislature. Persons may voluntarily contract to do what no legislature would have the power to compel them to do. Nor does it furnish the standard by which to measure the reasonableness of the matter enacted by the legislature. The action of the company upon its own volition purely as a matter of internal administration and in regard to the details of its business which it has the right to change at any moment furnishes no argument for the existence of a power in a legislature to pass a statute in relation to the same business imposing additional burdens upon the company."

Of course, a commission which derives its powers from a legislature cannot exercise more power than the legislature itself. The case of Interstate Commerce Commission versus C. G. W. (209 U. S. 108), which arose under the Elkins Act

and was decided by the Supreme Court after the amended Interstate Commerce Act went into effect, involved alleged unfair discrimination by the Chicago Great Western in charging higher rates on live stock than on packing house products. The court refused to hold, with the commission, that the rates on live stock were too high because the rates fixed on packing house products were lower, and said:

"It must be remembered that railways are the private property of their owners; that while, from the public character of the work in which they are engaged, the public has the power to prescribe rules for securing faithful and efficient service and equality between shippers and communities, yet in no proper sense is the public a general manager."

Continuing, it quoted with approval the familiar language of Circuit Court Judge Jackson in Interstate Commerce Commission versus B. & O. (43 Federal Report 37, 50):

"Subject to the two leading prohibitions that their charges shall not be unjust or unreasonable and that they shall not unjustly discriminate so as to give undue preference or disadvantage to persons or traffic similarly circumstanced, the act to regulate commerce leaves common carriers as they were at the common law free to make special rates looking to the increase of their business, to classify their traffic, to adjust and apportion their rates, so as to meet the necessities of commerce and of their own situation, and relation to it, and, generally, to manage other important interests on the same principles which are regarded as sound and adopted in other trades and pursuits."

The only difference between the law when the court quoted this language of Judge Jackson with approval and as it stands now is that the commission, to enable it to enforce the "two leading prohibitions" mentioned, has been given the power to fix maximum rates in specific cases. How, in carrying out these two leading prohibitions, it can lawfully disregard the interpretation of the Supreme Court is hard to see.

In some of the recent public utterances of members of the commission there has been a note of complaint because the railways within the past two years have appealed to the courts from many of its important orders. They have intimated this is not the best course to take if the carriers want to keep on good terms with the commission, shippers and the public. For some months after the amended Interstate Commerce Act went into effect, the carriers showed an extreme desire to get on amicably with the commission and the public. In numerous instances they abided by requirements which they believed exceeded the commission's legal power. At last they felt that they must choose whether they would submit to the constant exercise of authority that they deemed illegal or fight out in the courts the question of the extent of the commission's legal power. They took the latter alternative. The issue seems apt to be a drastic curtailment of the authority the commission has exercised. If this is the result the commission will have no good ground to complain. It was created to enforce the law. It frequently condemns the railways for seeking to evade it. It, therefore, of all bodies, should show a constant disposition to keep well within the law instead of a persistent tendency to stretch it to the utmost limit, or even to overstep its boundaries.

NEW BOOKS.

Commercialism and Journalism. By Hamilton Holt. Published by Houghton Mifflin Co., Boston, Mass., 1909. 105 pages, cloth. Price, \$1.00.

Mr. Holt is managing Editor of *The Independent*, and the book is a reproduction in type of a lecture delivered by him at the University of California—one of the Barbara Weinstock series of lectures on the morals of trade. He discusses the subject of ultimate power in control of the American journals and tells of the real conditions under which an editor nowadays has to work and of the forces that help and hinder him. While, unfortunately, Mr. Holt fails to show among his object lessons the increasing power of technical and trade papers in moulding public opinion, he has succeeded in painting a word picture of modern journalism in which the upward trend of the weekly and monthly periodicals, and the causes, stand out clearly.

Letters to the Editor.

THE SPEED LIMITS OF MALLETT LOCOMOTIVES.

Philadelphia, Pa., April 9, 1910.

TO THE EDITOR OF THE RAILWAY AGE GAZETTE:

In the article, entitled "The Speed Limits of Mallet Locomotives," on page 870 of your issue of April 1, 1910, you call attention to some very important limiting factors, consisting mainly of resistances due to the friction of the steam, in passing the necessarily long reaches of pipes in the system, on its way through the engine. You do not, however, call attention to the effect of the very large volume of the receiver of these engines, as usually built, to say nothing of the very large re-heaters which are sometimes used. These largely increase the ratio of expansion of the steam; in fact, to such an extent that I have serious doubts as to whether, under some conditions, there is sufficient pressure in the receiver to perform useful work in the low pressure cylinders.

A drop of pressure of the steam between the cylinders is, no doubt, beneficial, there being a valuable drying effect due to the free expansion. This is well illustrated by the indicator cards, which were published on page 93 of your issue of January 14, 1910, which were taken from the Mallet locomotive built by the Baldwin Locomotive Works for the Southern Pacific.

Neglecting the back pressure portions of the cards, we see that the release, which takes place nearly at the end of the stroke, is at approximately 155 lbs. abs. on the high pressure cards, while the initial pressure on the low pressure cards is approximately 75 lbs. abs., which indicates that the receiver volume must be about the same as the volume of the two high pressure cylinders. It is likely that this drop has a very good effect, as it is not enough to unduly lower the receiver pressure, but does lower it sufficiently to produce a slight superheating effect.

Taking for our next illustration, the large Mallet passenger engines built for the Atchison by the same works, we see that in addition to the usual receiver there is a large re-heater, the volume of which, after making allowance for the tubes, I find to be about 64 cu. ft. This added to the volume of the necessary passages makes the probable volume of the receiver about 75 cu. ft.

The total volume of the system through which the steam must pass between the high pressure valves and the atmosphere is probably as follows:

Two high-pressure cylinders	14.66 cu. ft.
Clearance volume of above, 15 per cent.	2.20 "
Receiver and reheater	75.00 "
Two low-pressure cylinders	36.75 "
Clearance volume of above, 15 per cent.	5.51 "

Total volume of cylinders and passages 134.12 cu. ft.

Assuming that the boiler of the engine is sufficient to supply steam to the high pressure cylinders at a cut-off of 75 per cent. at a speed of 50 miles per hour, we have a volume of 13.19 cu. ft. of steam, at a cut-off pressure of 165 lbs. abs., to be expanded to a volume of 134.12 cu. ft. Dividing 134.12 by 13.19 we find that the ratio of expansion is 10.25 to 1, and dividing 165 by 10.25 we find the terminal pressure to be 16.09 lbs. abs., or only 1.39 lbs. above atmosphere. This deduction neglects the small increase of pressure, due to the superheating in the receiver, which, at the speed assumed, would not be considerable.

To my mind, the M. E. P. developed in the low pressure cylinders with such a low terminal pressure would not be sufficient to overcome the internal resistance of the low pressure portion of the engine and under the conditions assumed it would be hauled at the expense of power developed in the high pressure engine. The result would be a net loss due to the free expansion caused by the volume of the devices used

to promote economy. If a shorter ratio of expansion were attempted with this engine it would result in the expansion line of the low pressure diagram going below atmosphere at a greater net loss of efficiency.

The question which occurs to me after a consideration of the above deductions is: Would it not be better in designing a Mallet locomotive for any service to take advantage of initial superheating, place the high and low pressure cylinders as close together as possible so as to minimize receiver volume and prevent drop of pressure between the high and low pressure cylinders and then if a long expansion ratio is desired, increase the ratio of the cylinders? As the expansion would be practically continuous we would have the drying effect, due to the fall of pressure and the increased volume of the low pressure cylinders, assuming that the same size high pressure cylinders were used, which would result in greater power being developed. The use of large receivers between the cylinders of compound engines can not result in much good, as the resulting free expansion does not perform work except in the same manner that excessive clearance in the cylinders of a simple engine raises the expansion line at the expense of efficiency.

A discussion of the above question by your readers would, no doubt, be interesting, and I trust that such discussion will follow in subsequent issues of your valuable paper.

CHARLES F. PRESCOTT,
Mechanical Engineer.

WHICH LINE MAKES THE RATE?

London, England, April 14, 1910.

TO THE EDITOR OF THE RAILWAY AGE GAZETTE:

I have read with much interest Professor Ripley's paper in the *Railway Age Gazette* of April 1 under the above heading, and, as I observe that he quotes me as saying in my little book, "The Elements of Railway Economics," sans phrase that 'the short line makes the rate,' perhaps you will allow me to say a word on the subject.

As a statement in an elementary text book for English students, I adhere to what I said. I am, of course, aware of the trunk line differentials. Further, I agree that, economically speaking, the "cheap" line would be a more accurate phrase than the "short" line, but for England and for long settled European countries the statement holds that the short line rules the rate.

There used to be one instance in this country, namely, between London and Guildford, where what I may call a trunk line differential existed for passenger traffic, and the South Western over its direct through line of 30 miles charged a higher rate than the South Eastern over its 43 miles of a roundabout branch; but the fares by both routes are now the same. There are many reasons why the fact that shortness is not necessarily cheapness has never emerged here. Capital cost is so large a proportion of total cost; terminal cost is so large a proportion of operating cost; local business is so large a proportion of through business; railway public opinion represses so sternly any inclination to cut rates, etc., etc.

Perhaps I may just add (for the sake of information, as the French say) for it is not strictly germane to my point, that the question how far the circuitous route is a reasonable route was recently before our Railway Commission Court in an important action dealing with through traffic from Ireland to the great English centers of population. In that case the court laid down that a route, convenient in other respects, and not longer by more than 50 per cent. than the shortest route, was a reasonable route, and as such entitled to through rates and to participate in the traffic. That the through rate would be the rate fixed by the shortest route was taken for granted.

W. M. ACWORTH.

Contributed Papers.

THE TRANSIT PRIVILEGE: ABUSES OF IT AND SOME PROPOSED REMEDIES.

BY S. O. DUNN,

Western Editorial Manager of the *Railway Age Gazette*.

The testimony taken by the Interstate Commerce Commission in its investigation of the transit privilege shows that this privilege is being greatly abused. It is being used as a means of securing by tariff authority special privileges which in many cases are in violation of the spirit, if not of the letter, of the interstate commerce act. It is conceded on all hands that these abuses cannot be allowed to continue. It is not desirable entirely to abolish the transit privilege. The problem to be solved is that of putting restrictions on it which will prevent its abuse, to the detriment of unfavorably situated shippers or the depletion of the revenues of the railways, without interfering with its legitimate use.

The transit arrangement is the privilege granted in many railway tariffs whereby the shipper may stop a commodity in transit, hold it for such period, and make such changes in it as may be specified in the tariff, and then forward it to destination, all for the through rate from the point of origin to the final destination, to which is added by some railways a small charge to cover the cost of stopping at transit points.

This privilege probably was first granted to millers of flour, its purpose being to put millers who, for one reason or another, had become unfavorably situated with reference to points of production of wheat and consumption of flour on a basis where they could compete with millers who were more favorably located. The earlier mills were generally established where the advantage of an abundant supply of grain, or cheap water power, or an adjacent center of population afforded the best prospect of establishing a profitable business. The rates on wheat and flour usually being approximately the same, a mill adjacent to the fields could buy wheat, grind it into flour and ship it to a large market as cheaply as a mill located at that market could buy the wheat, ship it there, grind it into flour and market it. As the demand grew for blended flour the millers at grain markets, who could buy various grades and ship the blended product, acquired an advantage over the western miller who had but one grade of grain available locally. The demand for wheat of the miller who was originally adjacent to the wheat fields also, in many cases, outgrew the local supply, either because his business expanded or because the wheat fields moved away from him. Then he found himself at a disadvantage in competing against the miller who was situated where there was a large local supply of grain on the one hand or a large local demand for flour on the other hand. The miller at Minneapolis, for example, could ship in wheat on a relatively low through rate, while the miller who was located midway, perhaps, between Minneapolis and the grain fields had to pay the local rate in on wheat and the local rate on flour. We will call the grain fields A, the intermediate point B, and the market C. If the miller at B was to stay in business it was necessary for the railway to make him a rate which would enable him to ship wheat from A to B and flour from B to C as cheaply as a miller at A could ship out flour from A to C or a miller at C could ship wheat from A to C. The railway might have protected the miller at B by reducing either or both of the local rates, A to B and B to C, so that their sum would equal the through rate from A to C, but by doing so it would have unnecessarily sacrificed its local revenues. The milling-in-transit privilege both enabled the miller at B to continue in business and conserved the road's local earnings.

Within recent years the transit privilege has been authorized on many commodities and at innumerable places. In some cases, as already stated, a special transit charge is

made. Throughout Central Freight Association territory a transit charge of $\frac{1}{2}$ cent per 100 lbs. is made on grain. On some of the western lines the charge on grain is $2\frac{1}{2}$ cents per 100 lbs. Transit is allowed on grain for a number of purposes besides milling. It is permitted for concentrating it from different points, for grading, cleaning and mixing, for changing ownership or destination, for blending of grain products, etc. It is allowed at reconsigning points for holding grain or its products in railway cars or warehouses pending change of ownership or destination. These various privileges may be granted near the fields, or at any convenient point intermediate between the points of origin and final destination. They may be extended to cover specifically grain privileges at milling points or milling privileges at market points. It is conceivable that a carload of grain originating in Illinois may receive the market privilege at Chicago, the milling privilege in Michigan, the reconsigning privilege in New York state, and be held in New England for the mixing privilege. It appears that in some cases in the exercise of the transit privilege a shipper may have brought in wheat and shipped out corn on the same billing, or he may have brought in corn and shipped out wheat flour, or he may have brought in wheat in carloads and corn in carloads and shipped out mixed carloads of wheat flour and corn meal.

Next to grain the commodity on which the transit privilege is most important is cotton. In the large, loosely pressed bales in which it is packed on the plantations it is moved to compresses in which its bulk is much reduced, the transit privilege covering not only compression but also inspection and change of ownership or destination.

Lumber is given the transit privilege for the rough grades to be dressed into the more finished grades and for drying, sorting, storing and changing of ownership or destination.

Butter is held in transit for repacking, reworking and storing; eggs for repacking and storing; poultry to be killed, dressed and stored. Like other commodities, these undergo changes of ownership while in transit; and they have been allowed to be substituted for each other on the same billings.

The transit privilege is granted for the fabrication of various classes of structural iron and steel. Seed is cleaned, coffee roasted, metals smelted; and sugar, salt, wool, apples, hay, agricultural implements and numerous other commodities are allowed to be stored and to change ownership and destination while theoretically in course of transportation.

The main criticism made against the transit privilege is that under it substitution of tonnage not necessarily representative of an identical commodity goes on, and such irregular substitution involves a departure from the published tariffs. The various forms of substitution may be roughly divided into four classes. (1) Substitution of a given amount of a commodity which moved into the transit point subject to the transit privilege for an equal amount of the same commodity which also moved in subject to the transit privilege but from a different territory. (2) Substitution of a shipment not entitled to the transit privilege for a transit shipment, or of a transit shipment for a non-transit shipment. (3) Filling out a transit shipment with a like commodity not entitled to the transit privilege, when, by processes of manufacture, or sale at the transit point, the tonnage of the commodity which moved in on transit billings has been reduced. (4) Substitution of one transit commodity for a different transit commodity, each subject to the same rate, as wheat for oats, poultry for butter, etc.

The Interstate Commerce Commission was aware of the existence of abuses growing out of substitution of tonnage a long time ago, and on September 1, 1909, put into effect its Conference Ruling No. 76, relating to substitution of tonnage at transit points, which read as follows:

"A milling, storage, or cleaning-in-transit privilege cannot be justified on any theory except that the identical commodity or its exact equivalent, or its products, is finally forwarded from the transit point under the application of the through rate from original point of shipment. It is, therefore, not permissible at transit point to forward on

transit rate commodity that did not move into transit point on transit rate or to substitute a commodity originating in one territory for the same or like commodity moving into transit point from another territory, or to make any substitution that would impair the integrity of the through rate. It is not practicable to require that the identity of each carload of grain, lumber, salt, etc., be preserved, but, in the opinion of the Commission, it is not possible to lawfully substitute at the transit point any commodity of a different kind from that which has moved into such transit point under a transit rate or rule. That is to say, oats or the products of oats may not be substituted for corn, corn or the products of corn for wheat, nor wheat or the products of wheat for barley, nor may shingles be substituted for lumber, or lumber for shingles, nor may rock salt be substituted for fine salt, nor fine salt for rock salt; likewise, oak lumber may not be substituted for maple lumber, nor pine lumber for either oak or maple, nor may hard wheat, soft wheat or spring wheat be substituted either for the other. These illustrations are not given as covering the entire field of possible abuses, but as indicating the view which the Commission will take of such abuses as they arise.

"To the end that abuses now existing at transit points may be eliminated, carriers will be expected to conform their transit rules and their billing to the suggestions of this rule. In the event of the failure of any carrier so to do, reductions of legal rates caused by transit abuses will be regarded as voluntary concessions from legal rates."

Some shippers and carriers paid little attention to this ruling. The abuses at which it was aimed continued. Finally, some months ago, the Commission took steps indicating that it meant to enforce it. Immediately protests poured in from all directions.

It has been said that enforcement of the Commission's rule would impair the transit privilege and do great injury to some, and this probably is true; however, it is also true that other reforms eliminating unfair railway discriminations have been accomplished only at the cost of considerable inconvenience and hardships to many persons. The grain dealer who does any considerable business receives wheat from various territories and mixes it in the bins of his elevator. Similarly, in the manufacture of any particular grade of flour different grades of wheat from various territories are mixed. Compliance with the Commission's requirement that hard wheat, soft wheat and spring wheat shall not be substituted either for the other would, therefore, revolutionize the grain and flour milling businesses.

The Commission's ruling probably is too broad in some respects and too narrow in others to effect needed reforms without destroying legitimate and beneficial business practices. A good many people who have studied the situation believe that three changes ought to be made: (1) The carrier should in every case where the transit privilege is granted impose a charge for it. (2) The transit privilege ought to be denied to or withdrawn from every industry to which it is not a legitimate necessity. (3) Such changes should be made in the rates or such regulations should be enforced as will make impossible the evasion of the tariff rates appropriate to the several shipments in any transit transaction through improper substitution of tonnage.

(1) The purpose of all these arrangements is to afford what amounts to a combination of local services for one through rate. Each of these local services frequently involves as complete a transportation transaction as if a local rate was applied to it. Cars are prepared, placed, removed, way-billed, hauled and accounted for just as when used in purely local service. The local rates usually are reasonable and just for local service; and competitive conditions have reduced many through rates close to the cost of the service. It, therefore, seems probable that in many cases where the carriers have granted the transit privilege they have thereby so reduced their earnings that they are rendering the transportation service from the point of origin to the final destination for a return perilously close to or even less than the cost of the service. Since the granting of the transit privilege is a source of expense to the carrier and of profit to the shipper, it would seem that it would be reasonable and proper for the carriers to adopt a policy of uniformly imposing a charge

for it, the charge varying in amount according to local conditions, the nature of the commodity and the conditions under which it is transported, all of which affect the cost and the value of the service.

(2) It will be found rather hard to draw a line between the commodities which should be allowed transit and those which should not. It seems to be essential to the regular flow of grain from the fields to the large primary markets and milling centers and thence to all parts of the United States and of the world. Probably it is equally essential to the free movement of cotton, too, from and through compress points. It is needed to enable butter, eggs and poultry to be concentrated for preparation for shipment under refrigeration to distant markets. No doubt there are some other commodities to whose free and satisfactory movement from points of production to points of consumption it is prerequisite. It must be borne in mind, however, that the carriers cannot afford to extend the privilege to all traffic, nor even to all traffic in the movement of which transit would be of value to the shipper. The ultimate effect of the unnecessary spread of transit is sure to be an excessive reduction of railway earnings. The criterion of whether transit should be granted to or allowed to be retained by an industry should be whether its enjoyment by that industry inures or would inure to the benefit of the public. If the demand for it grows out of changing conditions to which a few scattering concerns here and there find they are unable to adapt themselves, or if the demand for it is really a plea that the railways shall bolster up infant industries which it is sought to establish where general conditions are unfavorable to their establishment, or if the demand for its continuance comes from some concern to which it was granted on the infant industry plea and which has long since outgrown its swaddling clothes—in such cases it is evident that transit is sought to be acquired or retained on grounds that are not consonant with the interests either of the public or of the railways, and that it should be withheld or withdrawn. There seems no good reason, for example, why it should not be withdrawn entirely from the iron and steel industries. Nor does there seem any good reason why it should not be withdrawn from many interests whose use of it is connected with the speculative movement of commodities in which the freight rate is hardly an appreciable factor. A good example of such business is the concentration and holding of food products in cold storage.

(3) The devising of a plan or plans which will prevent substitution of tonnage that results in evasion of the legal rates presents a very hard and intricate problem. There are two standpoints from which the relation of freight rates to the transit privilege may be regarded. It may be argued that shipping a commodity into and out of a transit point on a transit billing is a very different thing from shipping certain quantities of a commodity into the transit point, selling them there and then shipping out on the transit billing other, but equal, quantities of the same commodity, which have been bought locally at the transit point or have moved into it on either transit or non-transit billings. The former is clearly a through shipment. The latter is two local shipments. Therefore, it may be contended that while the through rate may properly be applied on the former the sum of the local rates ought to be applied on the latter. It is replied to this that "wheat is wheat," "salt is salt," and that so long as the tonnage of a particular commodity which moves out of a transit point on a transit rate is the same as or less than the quantity of that commodity which moved into the transit point on a transit rate, no one is hurt and the integrity of the through rate is not affected. It may be quite true that the integrity of the through rate is not affected, but it seems clear that the through rate is applied on two local transactions; in other words, is substituted for the local rates, and that this involves a departure from the published rates unless such substitution is specifically provided for in the tariffs. Furthermore, the carrier is deprived of local revenues to

which it is entitled, and based on which the sale and purchase at the transit point was made.

The language of the commission's conference ruling No. 76 shows that it took the view that such substitution as is here referred to impaired the integrity of the through rate. For commercial reasons, however, it is impracticable to require that only the specific commodity which comes in on a transit billing shall go out on that billing. It is the universal practice in the grain and flour manufacturing businesses to put wheat from different territories into the same bins, where, of course, its identity is completely lost, or to mix the grain from different territories as may be necessary to such grading and blending as will make it marketable or fit to be ground into the various grades of flour. Furthermore, it is impossible to see who is hurt by thus mixing grain so long as only transit grain goes out on transit billings, under which it pays the legal rate from point of origin to point of destination. For example, suppose that a dealer brings in a carload of grain from A billed to B and another carload of grain from C billed to D. If, then, he ships the carload from A to D and the carload from C to B, he pays the full legal rate on the two carloads, and it is impossible to see who is hurt. The same thing may be said when the grain is mixed and ground into flour, one carload of which is shipped to B and one to D.

The improper substitution of tonnage must ordinarily be accomplished by shipment out on transit billings of commodities that did not come in on transit billings, or by sale locally of commodities brought in on transit billings, or by shipment out of transit commodities by carriers not parties to the transit billings, as, for example, by boats on the Great Lakes. The following is an example of substitution that affects the rates: The local rate from the Missouri river to Chicago is 12 cents; the local rate from Chicago to the Ohio river is 7 cents, and the sum of the local rates is 19 cents. The through rate from Missouri river points through Chicago to the Ohio river on a transit basis is 13 cents. Now, suppose a dealer at Chicago brings in grain from the Missouri river and sells it locally or ships it out by boat. The western line's billing entitling this grain to transit should then be canceled, but ordinarily it is not. Subsequently, the dealer ships from Chicago to the southeast a special kind of grain which originated at points in Illinois south and east of Chicago and which is not entitled to transit to the southeast through Chicago. He ought, under the published tariff, to pay a rate from Chicago to the Ohio river on this grain of 7 cents. What he sometimes has done is to ship it out on the billing on which he brought grain in from Kansas City. He ought to pay the local rate from Kansas City to Chicago on the grain disposed of at Chicago and the local rate from Chicago to the Ohio river on the Illinois grain, a total of 19 cents. What he has done by substitution of grain is to make two local shipments on a transit rate of 13 cents, and thereby cut the rate 6 cents. Such manipulation of rates as this is not peculiar to the Chicago market. It has been going on at almost every large grain market in the country.

Again, a miller ships in wheat on a transit billing and grinds it into flour. The total tonnage of the resulting products is somewhat less—perhaps 3 per cent.—than was the tonnage of the wheat. To make the tonnage that he ships out equal the tonnage he shipped in, he adds the products of grain that he has bought locally. In that case, on 3 per cent. of what he ships out, does he really pay any freight at all?

Similarly, a manufacturer of hardwood products largely embraced under the term "flooring," may, as shown at the hearing before the commission in Washington, ship in southern raw oak lumber from Cincinnati to Detroit, make it into flooring and ship it out to New York on a transit rate. When the lumber goes through the process of manufacture its tonnage is reduced about 50 per cent. Under transit rules that have been in effect in the past the shipper could fill out his tonnage from Detroit to New York with products of maple lumber that he had bought in northern Michigan and possibly brought

to Detroit by lake. The true principle of the transit privilege has been that the shipper should ship out only the commodities or the products of the commodities that he shipped in. The shipper in this case, while paying the same freight rate which a shipper of oak flooring would pay from the south to New York, could make assorted cars of oak and maple at Detroit, which the shipper in the south could not do, or he could dispose of a given amount of oak locally at Detroit and ship to New York on the oak billing an equivalent tonnage of maple received from the north. Not only might this impair the rates, but it is complained by other dealers who are trying to sell oak in the Detroit market, and who do not have transit, that, owing to the advantage which it gives those who do enjoy it, they are able to undersell other dealers locally in the Detroit market.

Still another form of abuse is the substitution of one commodity, such as corn and its products, for another commodity, such as wheat and its products, or cottonseed meal for corn meal. Such substitution is provided for in the tariffs of some roads. There is no justification for it on any sound principle of rate-making. If corn may be substituted for wheat, why may not any commodity be substituted for another commodity which happens to move on the same rate? Abolition of even this indefensible perversion of the transit principle is apt, however, to greatly harm or even destroy some small but deserving industries. Scattered over New England are numerous small dealers and millers who are now permitted to ship in carloads of the various grains and ship out under transit billing mixed carloads of these grains and their products. If the existing transit privilege were withdrawn, the business of many of the wholesale and retail dealers in the various grains and their products and numerous small millers might be injured, for, while many of the small retailers can handle mixed carloads of the various grains and their products, the number that could handle solid carloads of these commodities is small.

There is no doubt that strict enforcement of the commission's ruling No. 76 would stop substitution involving impairment of the legal rates. But, as has already been indicated, this would force a revolution in some businesses, particularly the grain and flour milling, which would do much harm to those engaged in these businesses and to the public. The commission can hardly justify its position in pressing identity of traffic to the point of making a distinction between grades of the same material or commodity having precisely the same general form and use.

Various methods for confining transit within legitimate limits without destroying it or compelling harmful revolutions in business methods have been suggested. One is the fixing of flat rates in and out of transit points to as great an extent as possible. Flat rates already are fixed in and out of many of the large markets, and it would seem that it should be feasible to apply them at practically all large centers.

Another scheme contemplates assuming that the quantity of a commodity forwarded on transit bears about the same ratio to the respective quantities of the commodity received from "long" and "short" rate points, as does the quantity of the commodity disposed of locally. It is, therefore, proposed that the railway shall open a book account with each shipper who desires to take advantage of the transit arrangement, requiring from him a bond for proper settlements. Suppose, then, a transit point at X, to which from a number of local points, A, B, C and D, the local rates vary, but from all of which the same through transit rate is made via X to certain large markets, E, F and G. When the commodity is shipped out of the transit point, X, the through rate from the point of origin to final destination is applied, and the local rate to the milling or storing point is refunded, except a 2½-cent transit charge. Accounts for inbound and outbound shipments would be kept, and in periodical settlements the inbound billings would be readjusted to the *average* local rate paid inbound on the commodity during the period. The require-

ment would be made that all grain purchased locally or which came in on non-transit billing should be included in the account. A settlement slip might then look something like the following:

Grain Rec'd.			
From	Lbs.	Local Rate.	Freight.
A	100,000	20 cents	\$20,000
B	100,000	15 cents	15,000
C	100,000	12 cents	12,000
D	100,000	6 cents	6,000
Local	100,000	..	.....
	500,000		\$53,000
Average rate	10.6 cents		

Deducting from the average rate the transit rate of $2\frac{1}{2}$ cents leaves 8.1 cents, which is the basis for refund.

Grain and flour forwarded to E	100,000 lbs.
" " " " F	50,000 lbs.
" " " " G	50,000 lbs.
Total	200,000 lbs.

at 8.1 cents equals \$16,200

If more than this amount had been refunded, it would have to be returned by the shipper; if less, an additional payment would have to be made to the shipper by the railway. Under present arrangements the shipper undoubtedly would present for refund A bills for 100,000 lbs. at $17\frac{1}{2}$ cents, amounting to \$17,500; B bills for 100,000 lbs. at $12\frac{1}{2}$ cents, amounting to \$12,500; total, \$30,000, leaving the balance of 300,000 lbs. disposed of locally to stand against the inbound tonnage received on lower rates or bought locally, the result being that the railway is out of pocket \$13,800. There is ground for questioning if this plan is legal, as it really contemplates averaging the rates on a number of shipments instead of charging a specific rate on each specific shipment.

Another plan which has been proposed and which, in fact, is in use at some places, is to require the oldest "in" billing to be presented when a transit shipment is to be forwarded. Under this arrangement the results are fairer than they are when the shipper is allowed to select bills from "long" rate points so far as they are available, leaving the grain disposed of locally to stand against billings from "short" rate points. It may be, however, that the shipper who desires to forward three cars of flour, for example, will find that his three oldest billings are billings from "short" rate points which will expire within a few days, and that his next oldest billings are from "long" rate points. In that case he probably will hold the grain until his older billings have expired and then use his later and more advantageous billings, in this way securing a rate advantage.

Still another plan which is proposed is to require that every time a transit company or its products is taken from a mill or warehouse, whether for local sale or for shipment out by water, or for shipment out by rail, billings to an equivalent amount shall be immediately canceled. If a commodity has been put through a process of manufacture which has reduced its tonnage, the billing canceled when its products are shipped out will be the equivalent in tonnage of the raw material which was shipped in. For example, if 100,000 lbs. of wheat are shipped in and ground into flour, the tonnage being thus reduced, say, 3 per cent., and 97,000 lbs. of flour are shipped out, billings for 100,000 lbs. of wheat will be canceled. No doubt billings would be canceled in the order of their age; and at any given time a miller or dealer would have billings for no more and no less than the equivalent of the commodity that he had on hand at that time. Unless this plan were administered scrupulously and in good faith, however, departures from the legal rates could be made under it.

The conditions met at different transit points vary widely. At some local consumption and local purchases are very small compared with the amounts of commodities shipped through en transit. At others the local purchases and consumption are relatively large. At some places, such as Milwaukee, Chicago and Buffalo, water transportation is available, while at most points all commodities move in and out by rail. To stop abuses of the transit privilege under these varying conditions

will be difficult, and will, no doubt, require varying remedies. The plan most generally in use and the one which seems to offer the most satisfactory solution if lived up to in good faith, provides for filing with an authorized railway transit bureau at each transit point freight bills for all grain which is to be given the transit privilege; the bureau retaining the freight bills and giving the owner of grain receipts upon which the freight bills can be recovered if the transit privilege is availed of. The transit bureau should be enabled to check all grain into and out of the elevators, and transit privileges should only be given to grain going into elevators or mills which are subject to rigorous inspection.

Probably, however, it is conceded by all who have studied this subject that there is not, and cannot be made, any transit rule or arrangement which an unscrupulous shipper cannot "beat," especially if he has the active connivance, or even the more or less guilty acquiescence, of the railway. After the best rules practicable shall have been made, abuses of the transit privilege probably will continue. If this shall be the case, the commission shall have to choose between two alternatives. It will have to completely abolish the privilege or to institute such wholesale prosecutions for its abuse as have been requisite to stamp other forms of rebating.

THE WEATHERING OF COAL.

The Engineering Experiment Station of the University of Illinois has just issued Bulletin 38, which contains the results of experiments conducted to determine the change in weight, the change in colorific value and the amount of disintegration that are liable to occur in the grades of coal found in Illinois and neighboring states under different conditions of storage, such as in the open air in piles; in covered bins, and under water. These experiments were conducted by S. W. Parr, Professor of Applied Chemistry, and W. F. Wheeler, first assistant, Department of Chemistry. This bulletin reports a continuation of the experiments of the weathering of coal published under the same title in 1907 in Bulletin No. 17. The experiments described in the present bulletin deal with car-load lots of coal under conditions comparable with actual experience in the storage of coal. Car-load lots of both nut and screenings were exposed in covered bins, in open bins and under water, for a period of one year. The initial values were determined for the freshly-mined coal, and analyses were made approximately after two days, ten days, two months, six months and one year.

Coal of the type found in Illinois and neighboring states is not affected seriously during storage when only the changes in weight and losses in heating power are considered. The changes in weight may be either gains or losses of probably never over 2 per cent. in a period of one year. The heating value decreases most rapidly during the first week after mining and continues to decrease more and more slowly for an indefinite time. In the coals that have been tested, 1 per cent. is about the average loss for the first week and 3 to $3\frac{1}{2}$ per cent. would cover the losses for a year, although in some instances the loss was found to be as high as 5 per cent. in a year.

The losses due to disintegration of the coal and to spontaneous ignition seem to be of far greater importance than any changes in weight and heating value, although they cannot be expressed in figures for comparison. The storage of coal of a size larger than is to be used would overcome part of this objection to storage, as the coal could be crushed to the most advantageous size just before firing. The larger sizes of coal are also much less liable to take fire spontaneously. Storage under water will prevent disintegration of the coal to a very large extent, and it will absolutely prevent any fire losses. Aside from these advantages in favor of storing coal under water, there seems to be very little to be said in favor of any particular method of storing coal.

RAY MORRIS.

Ray Morris, not quite 32 years old, after nine years in the *Railway Age Gazette* office, leaves this service to become a partner in the banking house of White, Weld & Co. He was born in New Haven, Conn., June 4, 1878, son of Ex-Governor Luzon B. Morris. His early education was in the Hopkins Grammar School in New Haven; he prepared for college at the Phillips Andover Academy, and graduated from the Academic department of Yale University in 1901.

The examination of one of the early stages of a man's career is liable to be quite as interesting to other young men as a record of complete life work. This is true only if it is taken at a turning point, so that it is a complete chapter in the volume. It is well to make such an examination with no purpose of flattery or criticism, but for its lessons only. Most boys and young men have at various times different ideas and intentions as to their career. Probably the larger proportion have no fixed ideas before attaining their majority.

Morris had a tremendous boy interest in ships and shipping. He does not know how early this interest began. It grew up with him until about the middle of his college course, when he spent a vacation in the Bath, Me., iron works. It was not the experience of a timekeeper and draftsman assistant in that iron works that discouraged him in his plans; it was rather the enlarged vision, which grew into a conviction, that ship designing and building had limitations not at all to his own mind. Nevertheless, the sea was long more than a dream to him; he had learned to know by sight every trans-Atlantic and coastwise steamer regularly entering the port of New York, and he had been on board most of them; he had traveled down the coast on a lumber schooner; he had been to England and Germany on oil tank steamers during two vacations. The shifting of his interest from ocean transportation to transportation by rail was due to the incident that his sister had become the wife of Professor Hadley, now president of Yale University. Hadley had previously been for several years an editorial writer for the *Railroad Gazette* and, before advising Morris definitely, he called at the office of the *Railroad Gazette*, and his suggestion was cordially received, to the effect that Morris should make his elective studies during the last half of his college course especially relative to qualifying himself for membership on the *Railroad Gazette* staff.

He came here in July, 1901, full of enthusiasm for the drudgery which was his first year's assignment. It involved hard work and extreme accuracy. It was estimated to be a full six days' a week work. It was a quantity of work such as no trade union would allow any of its members to exceed. Nevertheless, within half a year Morris had so organized it

and so persistently economized time that he was able to report to Colonel Prout, then editor, that he could do it all regularly in an average of 3½ days, and that he had 2½ days of time to spare. Of course, he got a chance at more important undertakings; the kind that he was reaching out for. It involved hours of study in the Astor Library, letters and talks with railway men and, perhaps best of all, seeing things and using his own eyes. He produced results. His first important study was published in this paper in August, 1902—"A Review by Decades of American Deepwater Steamers in Atlantic Coastwise Service." This probably interested only a few railway officers, but it had a deep interest to that few. It was a complete piece of work and a long, grueling study for a young man.

Transportation by water continued to interest him, but his work tended more and more to comparisons with railway service. During the year 1903 he produced a series of six editorial articles on the enlargement of the Erie canal, both the case against it and the benefits to be derived from it. It is difficult even now, looking back over that series of articles, to find any errors or even omissions of due consideration of all the facts which bear on the subject. It was neither argumentative nor partisan, nevertheless it is safe to say that if the voters of New York had been made acquainted with his exposition the state would not now be engaged in its wasteful expenditure. This series of papers, submitted to Yale University, gained for him the degree of Master of Arts, three years after his graduation.

Early in 1903 Morris became managing editor of this paper.

Orderliness is an essential quality for a clerk or secretary; it saves time. It has a greater proportionate value to a man who has gone farther because it saves more valuable time. The managing editor's desk load of manuscripts, drawings, photographs and



Ray Morris.

letters becomes dangerous in one day of neglect. Morris's method has been to clear it entirely by as early as 11 o'clock each morning. Letters were answered and obviously rejectable manuscripts were returned. Accepted manuscripts and material for illustrations were divided; those for his own consideration left on the desk for nearly immediate attention, while at 11 o'clock he started with considerable handfuls for a series of calls on the members of his staff. He had 12 men and some other assistants to keep busy and interested. He did not send for them; he went to their desks and so secured a daily thorough understanding with each one, both helping and directing, with the result of most enthusiastic team work.

Before lunch time he expected to have his desk entirely cleared, so that the afternoon could be left quite free for study, for writing and for interviews with men who had information. He always seemed to have in mind methods of

economizing time. He persisted in a budget form of appropriation of definite hours and even minutes for each piece of work and for each interview sought by himself. He developed a considerable skill in gently limiting the time of interviews sought by others.

Aside from hourly allotments of time, there were the daily divisions naturally resulting from the work of producing a weekly paper. The weekly editorial work is completed on Wednesday. On Thursday noon, Morris had a formal staff meeting, conducted in a thoroughly informal but wonderfully rapid fashion, the main object being to keep each man informed of what the other men were doing, to avoid duplication of work, to state general policies, and, as an indirect result, to cultivate zeal.

What might be called the organization in the small staff of a dozen men was as complete and clearly defined as in any railway corporation. All the men were encouraged to broaden themselves in general knowledge of railway work and, at the same time, maintain a specialty for minute study. The managing editor wanted, and obtained, specialists in traffic, operating, mechanics and engineering. For his own specialty of railway finance and administration, he had begun to qualify himself two years before he came to the office, and he never lost sight of it. Each man on his staff with a specialty had an understudy, and this developed good results. The understudy rapidly became a valuable assistant, and the system enabled the student to travel and become practically acquainted with railway working as well as with the ablest railway officers in the country. This knowledge and experience in the different departments of railway working is an essential to intelligent discussion of railway subjects. It was found by experiment that any member of the staff could be absent for as much as three weeks without inconvenience. Morris rarely allowed himself to be away longer than this, but he managed, with his developed skill in avoiding waste of time, to travel over and examine a representative part of the railways in the United States, and to have a pretty thorough knowledge of their sources of traffic and their methods of administration. Their methods of finance were more easily studied at home. In one case he sent a member of his staff for an absence of three months, pretty well covering the West, in making studies on one subject.

One important result of Morris's specializing, which happened to be the determining factor in his future career, was the making of a series of investigations and reports for bankers on railway and some industrial corporations and propositions. For about a year he was regularly retained by one banking firm for this work. It was only by great diligence and severe economy of time that he was enabled to do such outside work, but it was extremely valuable to him in the direct line of his work—a helpful check on his office work, and a constantly recurring incentive to thoroughness of a kind that is apt to be good for an editor. Moreover, it was remunerative, and his employers liked to see him get on. But he never had his eyes centered on a money return; it was always for knowledge.

The railway editor has a chance, when he has the ability to avail himself of it, of doing a good deal of good in the world in helping to a better understanding between the railways and the public. This always appealed strongly to Morris. He wrote five important articles for the *Atlantic Monthly*, one for the *Review of Reviews*, and for four years wrote nearly all the editorial articles in the Railway and Industrial Section of the *Commercial & Financial Chronicle*. Indeed, he was a frequent writer of editorial articles for newspapers and journals which get a broad audience in what we call the general public.

A rapid talker and writer on his chosen subjects, he sometimes gave an impression of cock-sureness to a careless observer. This may have been an early tendency, and it was not overcome by morbidly recognizing it as a fault and mak-

ing mental efforts to correct it; it was simply banished by increasing knowledge and a sincere love of truth. The only successful editor is one who makes it his main business to discover the truth; whether he then tells it or keeps silent or lies about it is another matter.

It takes years to get facts which a trained man can in a few days make available. Morris gave a striking example of this by unusual speed in writing an important book on Railway Administration. The book is not yet published, but his work is done. On January 10, he had completed chapters including about 15,000 words. The publishers asked for the completed manuscript on the first of March; he had available 49 days, including Sundays. Daily work was rather engrossing, and, so far, he had usually adhered to his rule of doing no work in the evenings at home, but in the interpretation of this ruling he did not classify hard reading as being work. The time had come when he must work overtime in order to keep his engagement; the results are rather interesting. By making his office hours a little longer than usual, and by devoting an hour or two to the work in the evening, he produced an additional 72,000 words in that 49 days, being an average of 1,470 words a day. Few writers in the world have ever averaged more than 1,200 words a day in any writing requiring care and accuracy; few novelists have ever done it. Of course, Morris could not have done it without the years of thorough preparation for this particular job. Also, an essential factor in it was his persistent outdoor habit, and that radiant health that comes from a well ordered life and lots of exercise.

It might as well be added here that a man's home life is apt to be an overwhelming influence in determining whether or not such an unusual quantity of work is possible. Marriage is rather an important item to a young man. On October 4, 1906, Morris married Miss Katharine Grinnell and it has proved to be a good undertaking.

Aside from doing the plain duty of speaking frankly of an associate who has in a few years gone far, the object of this writing is to show young men what a young man can do; how far diligence is an absolute substitute for genius. He has made money without having that result for his direct object; he has obtained recognition and respect, but this has been incidental. He simply worked on his chosen subjects with an eye single to getting all the facts and developing the truth, "to do a good job," as he was apt to express it.

Surely this nine years of activity has in it some inspirations for the young man who wants to do something beyond making a living or getting rich. A university education in such a career is an essential, unless a man happens to have enough genius and persistence and physical energy to overcome the lack of it. The aim needs to be higher than either money or fame. The man who devotes his life and maintains his aim at getting rich is reasonably certain to get rich, and we do not need to cite any of the many examples to show that that success, alone, is really absolute failure. Striving for fame also usually succeeds, if it is accompanied by ordinary intelligence and persistence, but such fame so acquired usually results in its possessor being only a passenger. Knowledge, usefulness and permanent health are better targets, and success in this kind of aiming makes all the rest easy.

In this highly scientific period of the world's history, the distinction among successful men between the theorist and the practical man has disappeared. The subject of this writing illustrates this quite clearly; he has devoted the first brief section of his life to the deep and thorough study of one subject, accompanied by many and quite enough other investigations, which have had the result of broadening him, and he has already shown value in practising what he has studied. In one instance, a small railway was bought outright, based on his investigation and report, and he subsequently was asked to become a member of the executive committee and

comptroller. This task he accepted, not because he wanted any railway office, but because, for a time at least, the extra work involved in fulfilling with thoroughness the supervisory duties of this small railway company would give him fuller knowledge.

The real student is the real practical man. There are plenty of similar instances, and on a larger scale. A. H. Joline, a great railway lawyer, Judge Lovett and Judge Gary found themselves immediately qualified for presidential work. Younger professional men, such as W. D. Hines, of the Atchison, and Roberts Walker, of the Rock Island, have shown how quickly the thorough student can become the great administrator. The list of examples might be extended indefinitely to illustrate to young men that a life devoted to purposes of knowledge, usefulness and health is better than aiming at money or fame, and that orderliness, persistence, industry, a full quota of recreation and an avoidance of idleness are pretty good qualities to keep an eye on.

W. H. BOARDMAN.

NEW STEEL PULLMAN SLEEPING CAR.

The Pullman Company has already furnished a number of the steel sleeping cars to be used by the Pennsylvania Railroad when it opens its service through the tunnels into New York City. Four hundred and eighty-seven steel cars, including sleeping, parlor and observation cars, are being built for use on the Pennsylvania for Pullman service. The dining cars for the tunnel service have been built by the railway at its Altoona car shops; many of the steel coaches and mail cars have been in service more than a year.

Since the first steel sleeping car, "Jamestown," was built in 1907 a number of changes and improvements have been made in the designs so that the weight has been reduced to 137,200 lbs. The new sleeping cars are 73 ft. 6 in. long over end sills, and the underframe without fixtures weighs 27,000 lbs.; the two trucks weigh 40,000 lbs., leaving 70,000 lbs. for the weight of the upperframe, brakes, drawbars, buffers and all finish and fixtures. The sides are covered with metallic sheathing, whose chief merit is the ease with which it can be repaired and painted. The roof is made of steel sheets

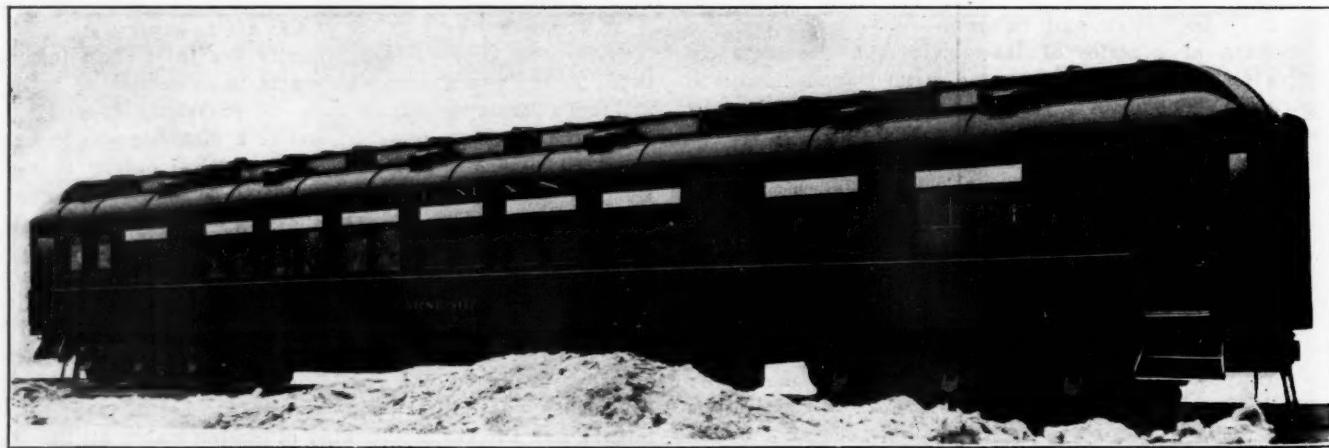
with expansion joints which are flanged upon each side of a carline rib and covered with a U-shaped cap on the outside.

The underframe is a combination of large steel castings.

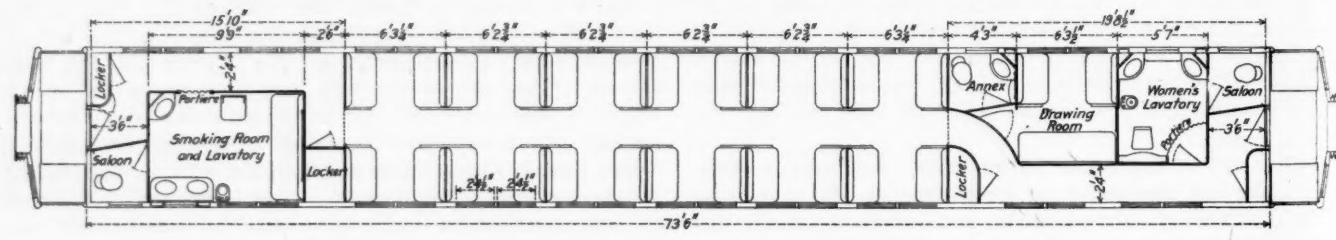


Interior View of Steel Sleeping Car.

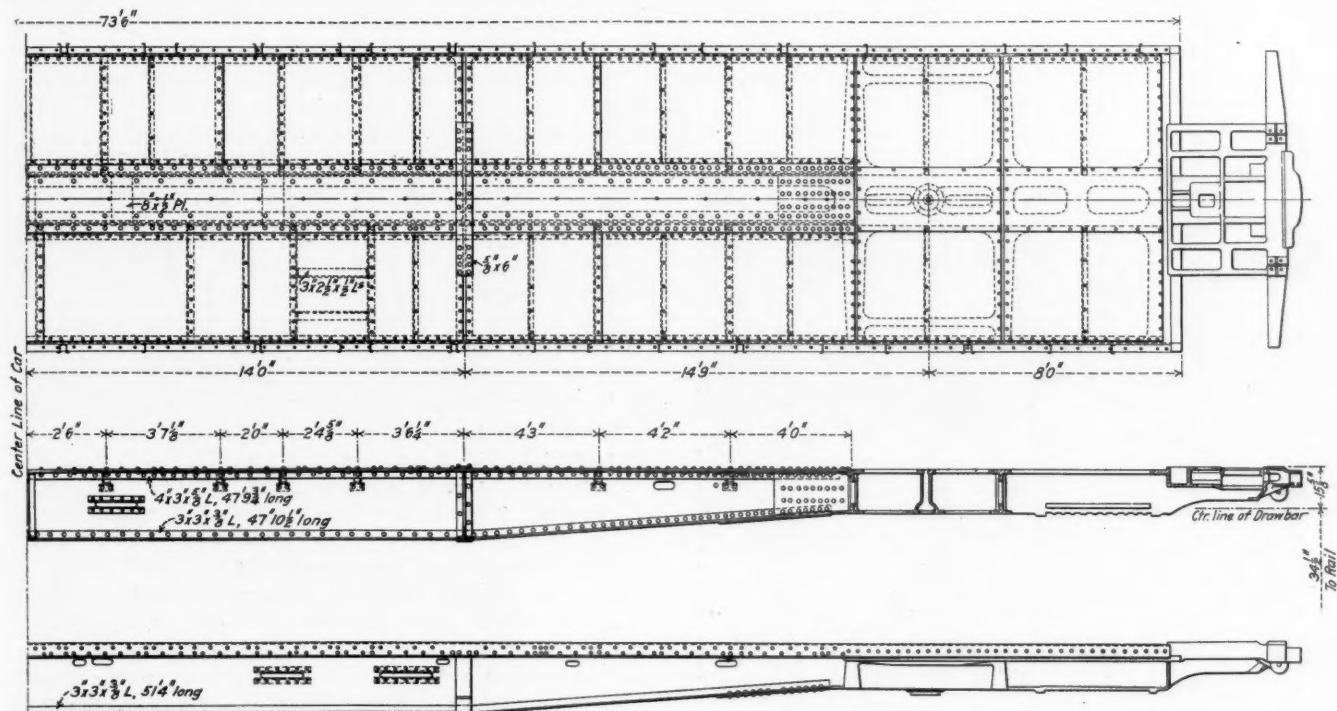
which form the end portions from the body bolsters to the end of the platforms, and structural steel girders forming the center sills which are the main compression members. The



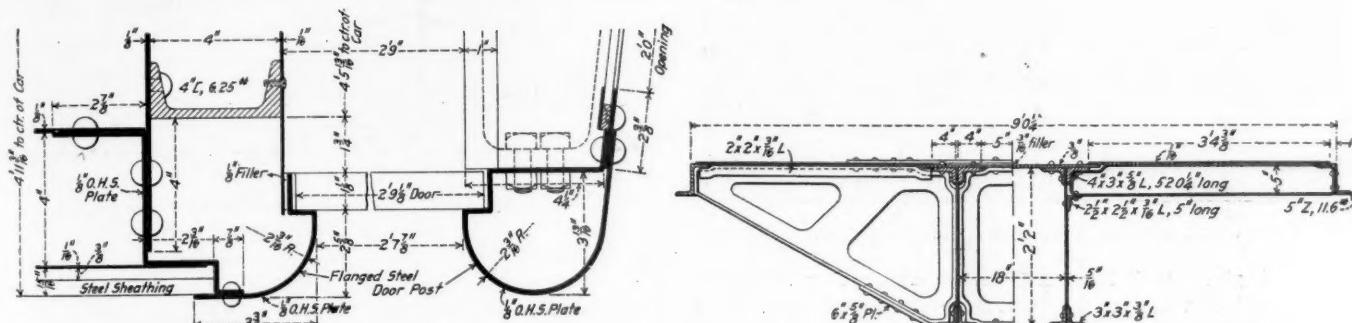
Pullman Steel Sleeping Car for Use on the Pennsylvania.



Plan of Pullman Steel Sleeping Car for Use on the Pennsylvania.

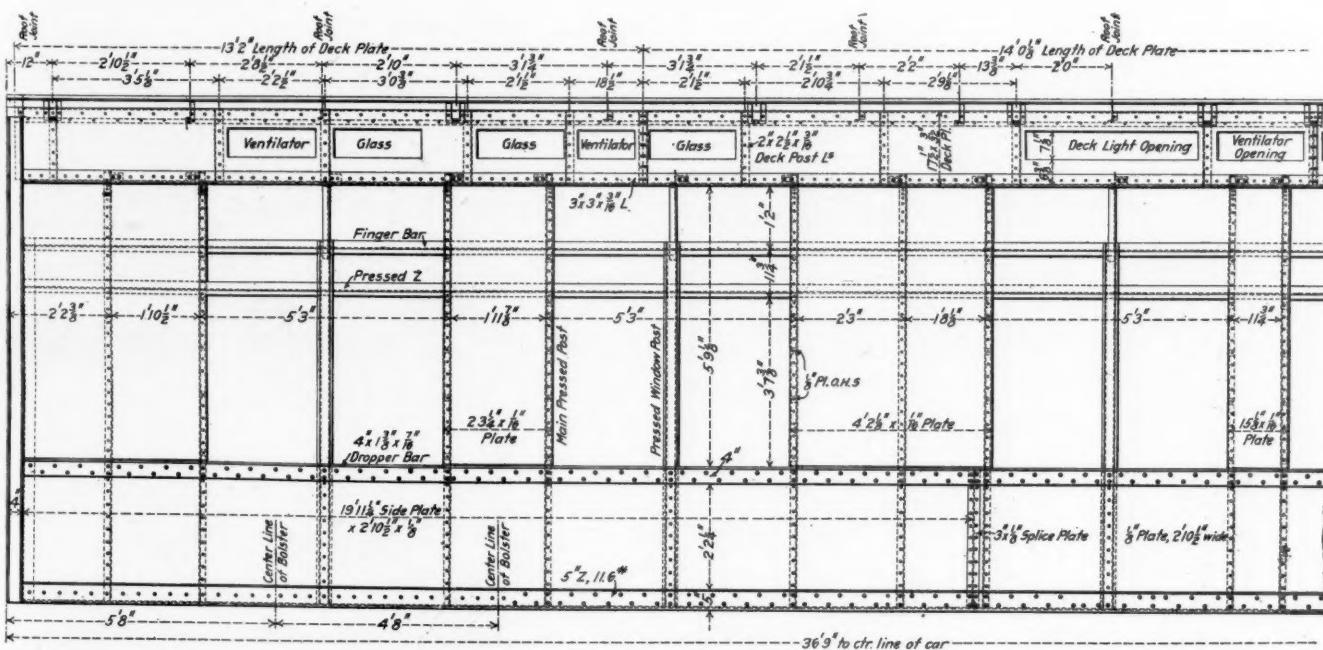


Plan and Elevations of Underframe of Steel Sleeping Car.



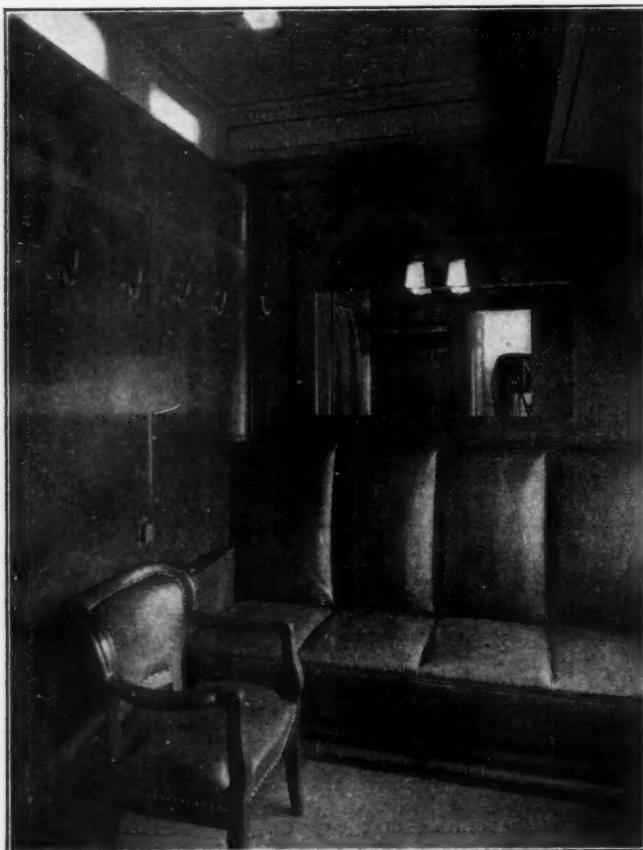
Body and Vestibule Corner Posts.

Sections Through Underframe of Steel Sleeping Car.



Side Framing of Steel Sleeping Car.

steel casting forms in one piece the double body bolster, the end sill, the platform with cored pockets for the buffer springs and the buffer beam. The center sills are deep fish-belly girders with a cover plate on top and are 26 in. deep at the center and 16 in. deep at the ends. They are built up of



Smoking Room of Steel Sleeping Car.

$\frac{1}{8}$ -in. web plates with $3 \times 3 \times \frac{3}{8}$ -in. angles forming the lower flanges and $4 \times 3 \times \frac{3}{8}$ -in. angles for the top flanges. The cover plate is 30 in. wide and $\frac{3}{8}$ in. thick. Between this and the side sills there is a solid steel floor plate $\frac{1}{8}$ in. thick. The two main crossbearers have cast steel fillers; the shape and

construction of these are plainly indicated in the view of the cross-section of the underframe. The side sills are 5-in. Z-bars, 11.6 lbs. per foot, and form the lower flanges of deep girders which include the side plates below the windows. These plates are 2 ft. 10 $\frac{1}{2}$ in. deep and $\frac{1}{8}$ in. thick; the top flange at the window sill is an angle $4 \times 1\frac{3}{8} \times \frac{1}{8}$ in. These deep girders, as well as the remainder of the steel side construction are designed to carry a large portion of the load.

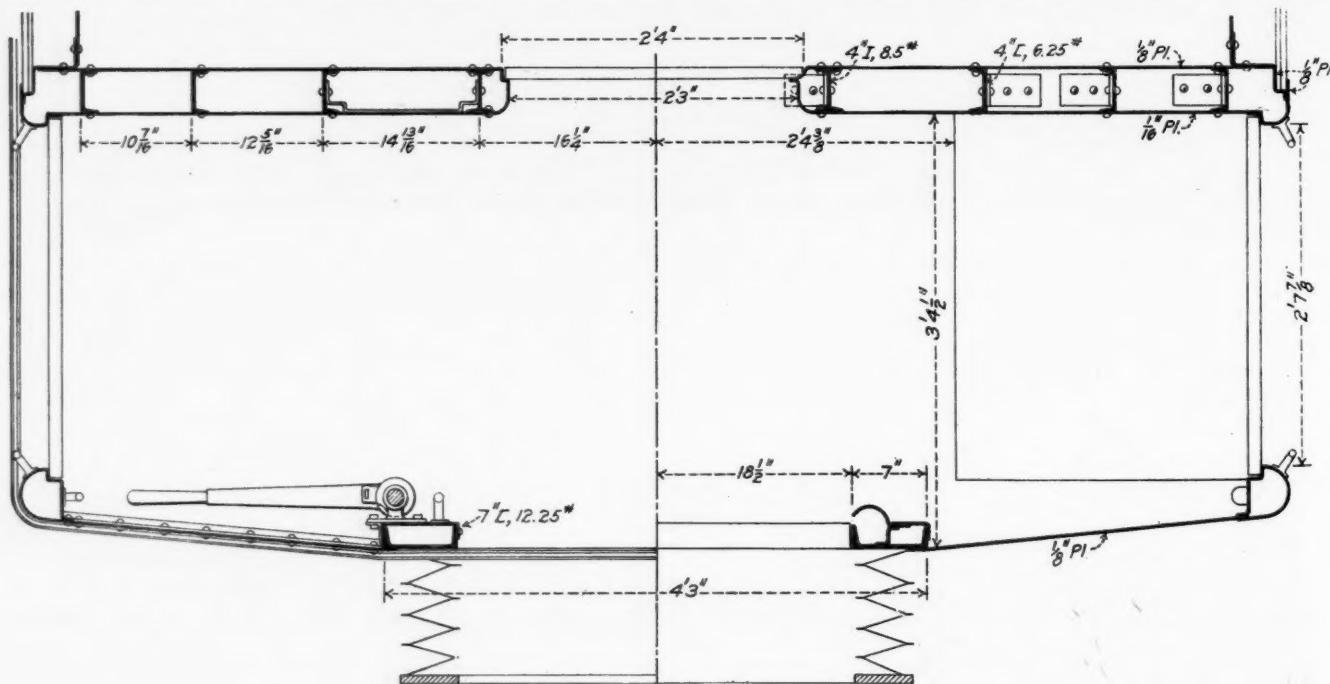
The posts are pressed steel and extend from the floor to the main plate. The plate is an angle $3 \times 3 \times \frac{3}{8}$ in., and it completes the side construction, the upper and lower deck forming a separate construction which is built complete on the shop floor and then raised in position and riveted on.

The end walls and platform construction have been worked out in a very substantial manner and details of this portion of the car are included in the illustrations. The end door posts are 4-in. I-beams, 8.5 lbs. per foot. The corner post and two intermediate posts in the end wall are 4-in. channels, 6 $\frac{1}{4}$ lbs. per foot. The entrance door casings at the steps are $\frac{1}{8}$ -in. steel plate flanged closely to the shape of the present wooden casings; these also are shown in detail.

The buffing device is the Forsyth patent and the Waugh friction draft gear is used in connection with it. The interior arrangement of the car is shown in the floor plan. It contains 12 regular Pullman sections, 1 drawing room, women's lavatory and men's smoking room and lavatory, the latter being 9 ft. 9 in. long. The inside finish is entirely of metal with the exception of the sash and seat arms. The berth fronts and side panels are painted in imitation of mahogany, and the general appearance of the interior of the car is similar to that of cars finished in wood.

HENRY JOHNSON.

Henry Johnson, who was one of the early leaders in railway signaling in America, and who was a pioneer in England as well, died at his home, "Hazelmere," Rahway, N. J., April 5, at the age of 72; and this department of the railway world has lost its Nestor. Mr. Johnson had a prominent place in the development of the signaling art in Great Britain and then came to this country in time to do fundamental work here also. English ideas have borne a prominent part in the establishment of the science of signaling in the United States, especially in keeping experiments anchored in a reasonable



Section Through Vestibule and End Framing of Steel Sleeping Car.

degree to conservative methods, and Mr. Johnson was a chief exponent of those ideas.

He was born at Higham Ferrers, Northamptonshire, England, and on leaving school went into the shops of Stevens & Sons, signal manufacturers, and with this firm he worked 14 years. Then for 13 years he was with Saxby & Farmer as superintendent of construction. His period of service with this concern, the best known signal establishment in the world, covered the years in which, under pressure from the government, the railways of Great Britain began the introduction of interlocking for switches and signals, a comprehensive movement in which that country led the world, and which has been an important factor in making the English railways the safest in the world. Mr. Johnson superintended the construction of innumerable plants in the north of England, in Scotland and in Ireland, and he was the inventor of some of the most useful and best known appliances in use to-day. As an inventor, he is best known probably as the designer of the present style "A" (vertical) interlocking machine, the outside, bevel-edge detector bar and the cam action rail clip for detector bars. His invention of the liquid compensator, for use in wire lines for moving signals at a long distance from the cabin, brought him a silver medal from the International Inventors' Exposition at Kensington, London, in 1885. The anti-friction pipe carrier, the mechanical slot, the mechanical selector are other devices in the development of which he had a hand.

Some time before coming to America Mr. Johnson left the manufacturing business and was appointed superintendent of signals for the Lancashire & Yorkshire, which office he held for several years. He came to America in 1886, and was appointed manager of the Union Switch & Signal Co. In 1888, in conjunction with his nephew, Charles R. Johnson, he established the Johnson Railroad Signal Co., and built a factory at Rahway, N. J. In 1895 Charles R. Johnson died, and the company was sold to the National Signal Co., Easton, Pa. In 1896 Mr. Johnson joined John T. Cade in the establishment of the Standard Railroad Signal Co., and was for several years its president. The Standard, with the Pneumatic Signal Co. and the Taylor Signal Co., were the three companies which later were consolidated in the organization now known as the General Railway Signal Co. After the Standard became well established, Mr. Johnson retired from active business and for the last few years has lived in retirement at his home in Rahway.

Mr. Johnson had four children, namely, Arthur H., who is superintendent of telegraph and signals of the London & South Western; Hilda J., who died some time ago; Sidney G., who is general sales manager of the Union Switch & Signal Co., and Edward C., who died in 1900. His widow survives him.

Mr. Johnson was not only a walking encyclopedia of the

history of railway signaling, but was a most agreeable person to meet outside of his profession. To his counsels many a signal engineer of the present day gives the credit for having been started along right lines. It is due largely to his efforts that the art of signaling has reached its present degree of perfection.

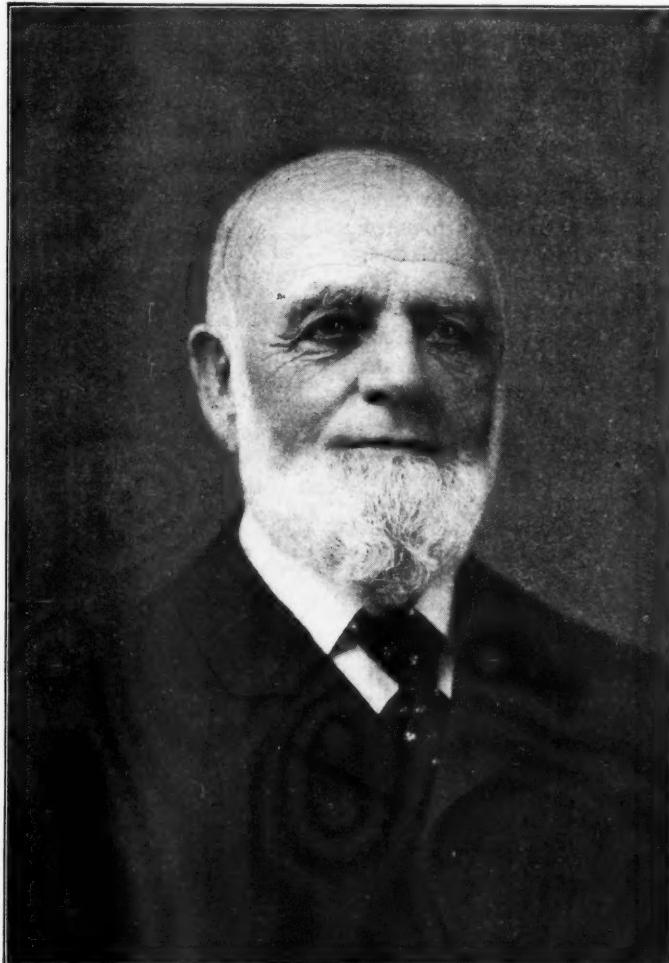
WILLIAM W. SNOW.

William Wait Snow died April 26, aged 81. During late years he has lived quietly at his home in Hillburn, N. Y., enjoying anniversaries, his children and grandchildren, his friends and the many who were dependent on him. His memory was good and in his long active life he stored up knowledge and gained wisdom, and so he was an ideal sage, always available and valuable to his friends and to the officers of the corporations he had once fathered.

Probably the most important and effective period of his life was the last quarter of the last century, and time so flies that its events are forgotten by most of the people who knew them and are largely unknown to the railway men of the present day. Mr. Snow was at Ramapo, in Rockland county, New York, near the New Jersey line, making cast iron car wheels, but he made better cast iron wheels than anyone else. He used Salisbury iron freighted from the mines in Connecticut, and his early idea was that honesty is a pretty good policy. He made rather a high-priced car wheel that was highly economical in service. He was, however, much more than a manufacturer. He became a great salesman in spite of the drawback of being naturally bashful, and this was because he was truthful, because he liked people, and because these two qualities were so plainly apparent to every railway officer he called on. His market was based on his character. His customers bought his product

on his statements, knowing that they would not be deceived. In this and in many other qualities he was wonderfully like his most intimate friend, Aaron French, who made springs at Pittsburgh. But Ramapo was not an economical point for the manufacture of car wheels during the later period of fierce competition in cheap cast iron wheels. Mr. Snow foresaw the fading out of his business long before it began to fade out, and, moving a mile farther down the beautiful Ramapo valley, he founded a new village and a new works for making track material, and under his control the Ramapo Iron Works formed the basis for the new community. Another mile farther down the river there grew up under his influence the works of the American Brake Shoe & Foundry Co.

Mr. Snow was born in Heath, Mass., in 1828, a son of Colonel David Snow, who commanded a volunteer regiment during the war of 1812. He was sent to the village school



William W. Snow.

and later went to both day and night schools. It was some time before he found the right field for his activities. His parents first wanted him to be a minister; then he learned the bookbinding trade, at which he worked in Greenfield, Mass., and in Troy, N. Y. After about three years of this he volunteered to go around the Horn with a thousand young men to help the Americans in California fight the Mexicans. He wrote home that he was going, but his older brother went to Troy and made such a mental and physical impression on him that he changed his plans.

He then started in the foundry business, working with his brother at Woonsocket, R. I., and later in another foundry at Worcester, Mass. When he was 21 years old he married Olive Estes. In 1856 he went to Indianapolis, Ind., as foreman of a foundry, and later returned to Massachusetts, where, in a foundry at Millbury, he took out his first patent on a car wheel. He soon went to Fishkill Landing, N. Y., to make these wheels, and in 1857 moved to Newburgh, N. Y., under the advice of, and with some help from, Holmer Ramsdell, then president of the Erie Railroad, to make car wheels with Isaac Stanton, under the firm name of Snow & Stanton. The firm went under in the panic of that year and he went to work in the Washington Iron Works. Next he took charge of the Union Car Wheel Works at Jersey City, N. J. In 1866 he went to Ramapo and a few years later he helped to start a foundry at Waverly, N. Y. During later years he founded the Ramapo Iron Works, the Steel Tired Wheel Co., and, finally, the American Brake Shoe & Foundry Co.

His relations with his many employees were always ideal. He had built up these communities; he did not boss them, but everyone in the valley naturally came to him with their joys and sorrows and needs. He accepted all responsibility, but always with a kindly, gentle air of being favored with their confidence. There was a time when few people owned so many \$500 to \$1,000 mortgages as did Mr. Snow. He was often called a patriarch, but he was a wonderfully alert and effective one. He always liked to be, so far as possible, unknown in his good deeds; nevertheless, he was really masterful.

For diversion he always turned to nature. Even the Ramapo valley was not quiet enough for him. For vacations he wandered deeper and deeper into the then less known Adirondack woods, and he enjoyed them either alone, or with Aaron French, or some other intimate friend. He was a fisherman of the Isaac Walton type, not a particularly good fisherman, but with an infinite capacity for enjoyment of streams and lakes. He tried to enjoy hunting, but killing things with a rifle quickly became distasteful to him.

ACCIDENT BULLETIN No. 34.

The Interstate Commerce Commission has issued accident bulletin No. 34, showing the record of railway accidents in the United States during the three months ending December 31, 1909. The number of persons killed in train accidents was 244, and of injured, 4,149. Accidents of other kinds bring the total number of casualties up to 22,922 (1,073 killed and 21,849 injured).* These reports deal only with employees on duty and passengers. The casualties to passengers also include passengers traveling on freight trains, postal clerks, express messengers, employees on Pullman cars, etc.

TABLE NO. 1.—*Casualties to Persons.*

Causes.	Passen-		Em-		Tot'l persons	
	Kil'd.	Inj'd.	Kil'd.	Inj'd.	Kil'd.	Inj'd.
Collisions	23	1,561	120	1,106	143	2,667
Deraillments	16	616	61	448	77	1,064
Miscellaneous train accidents . . . . .	..	45	24	373	24	418
Total train accidents	39	2,222	205	1,927	244	4,149

*The statistics here given present the record of the standard railroads, for convenience called "steam roads," in distinction from electric railways. The accident statistics of those electric lines on which interstate traffic is carried, and which, therefore, are subject to the Federal accident law, are given in the last paragraph of this article.

Cause.	Passen-		Em-		Tot'l persons	
	Kil'd.	Inj'd.	Kil'd.	Inj'd.	Kil'd.	Inj'd.
Coupling and uncoupling . . . . .	..	..	66	837	66	837
Other work abt trains or switches . . . . .	..	..	44	5,044	44	5,044
In contact with bridges, etc.	2	9	30	347	32	356
Falling from cars or engines or while getting on or off	50	711	167	3,696	217	4,407
Other causes	14	746	456	6,310	470	7,056
Total, other than train ac'd'ts.	66	1,466	763	16,234	829	17,700

Total, all classes 103 3,688 968 18,161 1,073 21,849

The quarter here reviewed was one in which there was a large volume of traffic on the principal railways of the country, and those classes of casualties which occur mainly in the freight-train service show heavy totals. The only collision in which more than five persons were killed was that shown in the table of causes as No. 10, and the victims in that case were not passengers; yet the total of passengers killed in collisions is 23. The only derailment in which more than three persons were killed was that shown in the table as No. 12. But though accidents which are very prominent by reason of the large number of fatalities attending them are thus shown to have been comparatively few, the list of causes, as shown in the 15 notes explanatory of causes in Table 2A is more than usually varied. The comparisons of the principal totals follow:

TABLE NO. 1A.—*Comparisons of Principal Items with Last Bulletin and with One Year Back.*

	Bulletins		
	No. 34.	No. 33.	No. 30.
1. Passengers killed in train accidents	39	56	34
2. Passengers killed, all causes	105	104	98
3. Employees killed in train accidents	205	137	150
4. Employees killed in coupling	66	38	44
5. Employees killed, all causes	968	748	700
6. Total passengers and employees killed	1,073	852	798

The total number of collisions and derailments was 3,206, as follows:

	TABLE NO. 2.— <i>Collisions and Derailments.</i>		
	No.	Loss.	Persons
		Killed. Injured.	
Collisions, rear	426	\$421,188	47 916
" butting	221	542,737	53 920
" train separating	119	38,696	2 57
" miscellaneous	979	445,343	41 774
Total	1,745	\$1,447,964	143 2,667

Derailments due to :

Defects of roadway, etc.	303	\$322,808	23 363
Defects of equipment	680	512,275	8 135
Negligence	119	76,297	4 97
Unforeseen obstruction of track	82	93,670	20 116
Malicious obstruction, etc.	16	25,735	5 63
Miscellaneous causes	261	255,081	17 290
Total	1,461	\$1,285,866	77 1,064

Total collisions and derailments	3,206	\$2,733,830	220 3,731
Total for same quarter of 1908	2,684	1,940,133	173 2,616
Total for same quarter of 1907	3,964	2,962,470	197 3,813

Following is the usual list of class A train accidents—all in which the damage is reported at \$10,000 or over, notable cases in which passengers are killed, and those doing damage less than \$10,000 and down to \$2,000, wherever the circumstances or the cause may be of particular interest:

TABLE NO. 2A.—*Causes of Forty-four Prominent Train Accidents.*
[NOTE.—R. stands for rear collision; B., butting collision; M., miscellaneous collisions; D., derailment; P., passenger train; F., freight and miscellaneous trains.]

No.	Class.	Kind of train.	Collisions.			Cause.
			Killed.	Injured.	Damage to engines, cars, & roadway.	
1	R.	F. & P.	0	149	\$1,650	43
1	R.	F. & P.	0	149	\$1,650	43
2	R.	F. & P.	0	0	1,700	18
3	B.	F. & F.	1	1	2,085	51

Passenger train standing at station (9:15 p.m.) not properly protected at rear; atmosphere very smoky from forest fires. (The list of casualties in this accident includes 25 passengers entered as injured who "claimed" to have been injured.)

False clear block signal. (See note in text.)

Engineman of engine without train disregarded order to wait at a certain station. Fireman, 23 years old, in service one month, was killed.

*The statistics here given present the record of the standard railroads, for convenience called "steam roads," in distinction from electric railways. The accident statistics of those electric lines on which interstate traffic is carried, and which, therefore, are subject to the Federal accident law, are given in the last paragraph of this article.

due to a fault in an electro-pneumatic interlocking machine. An eastbound passenger train, approaching J at ordinary speed, was turned through a cross-over track and collided with a locomotive moving westward on the westbound track, though the signals, both home and distant, approaching the cross-over, indicated that the switch was right for the passenger train to proceed along the main line. A train had passed through this cross-over a few minutes before, and after its passage the signalman in the cabin had moved the proper lever to reset the switches of the cross-over in position for movements along each of the two main tracks. For some reason unknown the switches did not respond to this movement of the lever and remained set for train movements through the cross-over. Assuming that the route was set along the main tracks "straight," the signalman cleared the signals for the passenger train. With the interlocking apparatus in good order he would have been unable to do this, as the signal levers would have been locked immovable; but by the loosening of a contact spring in the machine an improper electrical contact was completed, and the machine therefore failed to perform its function of preventing the wrongful clearing of the signals for a main-track movement. The trouble with the spring was that it was not properly fastened to its base. A more secure method of fastening for apparatus of this kind has now been adopted by the road.

Collision No. 13 was due to the misplacement of a switch by a brakeman 22 years of age, of 17 months' experience, and of good character. The freight train, eastbound, was standing on a side-track waiting for a westbound passenger train. The brakeman was under the impression that his train had entered the side track because the engine was leaking and for no other reason, and that as soon as the engineman could get up steam the train would proceed. On this presumption he set the switch to connect the siding with the main line; and a few minutes afterwards the passenger train came on at full speed, and, running into the siding, collided with the standing freight train. The line being curved and the view obscured, the passenger engineman had no view of the switch until he was very close to it. The fireman of this train, who could have seen this switch farther away, was killed.

Collision No. 15, occurring very early in the morning, before daylight, was due to the misconduct of a switch tender. The line on which it occurred is equipped with automatic block signals, and at the yard in question the yardmaster, who supervises the operations of switching engines, authorizes such engines to occupy the main track when a passenger train is due, provided he has received definite information that the train is behind time. Before allowing a switching engine to enter the main track a switch must be set connecting the siding or cross-over with the main track, and the setting of this switch automatically causes the setting of the block signal for that section in position to stop any approaching train. At each switch there is an electric indicator by observing which the attendant, when he is about to set a switch, can see whether or not the block section is already occupied; that is to say, whether or not an approaching train has already passed the block signal. When the indicator thus indicates, he must not set the switch for the siding. In this case the switch tender, a man of three years' experience, set the switch for the siding without looking at the indicator and without having received authority from the yardmaster. His statement that he had received a hand-motion signal from the yardmaster is not accepted by the superintendent, the evidence showing that such could not have been the case.

Collision No. 18 was due to a misplaced switch, the lock of which had been taken off and the light of which had been extinguished; and the officers of the road are satisfied that the switch was misplaced by unknown persons intending to wreck the passenger train. The collision occurred at about 9 p.m. The switch was known to have been in the right position and with its light properly burning at 7 p.m. It had been used at 8:25 p.m., but as the switch rail and all the

other appurtenances were found in perfect condition, it is concluded that the switch could not have been left misplaced at that time. The approach to the switch is on a curve of 6 deg., shortening the view, and there was also a dense fog; and, in consequence of the fog, the engineman did not note the absence of the light until he was very close to the switch. This engineman was a runner of 29 years' experience.

Collision No. 19, occurring on a single-track line, is reported as due to wrongful or careless dependence on an automatic block signal. A freight train about to enter the siding at S was not stopped at the proper place and had to be set back a short distance (on the main line) to be in position to enter the siding. It was moved back so as to foul the next block section in the rear, but no flagman was sent back, and a following train came on and collided with the rear of the first named, the second train having entered the block (under a clear signal) before the backing freight entered it. The men in charge of the backing freight believed or assumed that the signal at their end of the block was clear, indicating that no train was approaching; but the superintendent concludes that this signal changed from "clear" to "stop" before the caboose passed it. The omission of the train to stop before reaching the side-track switch is reported as due to an error on the part of a telegraph operator.

Collision No. 20, between a northbound passenger train and southbound freight, was due to the neglect of a flagman and the failure of a delayed freight train to give suitable notice of its whereabouts. The freight was delayed five miles north of D. After about four hours the engine of this freight ran forward to D, carrying a flagman, who was left there to stop the northbound train, the engine then returning to its train, one car of which was off the track. The flagman, after remaining at this station about seven hours, was sitting on the steps of the caboose of a freight train standing on the side track, with his lantern on one of the lower steps of the caboose, between his feet. While so sitting he fell asleep and was not aroused until the northbound passenger train came along and passed him; and then it was too late to give a signal to the passenger train, which passed on and collided with the freight about four miles north. The red lantern, being on the steps of the caboose, was hidden from the view of the engineman of the passenger train. It appears that this flagman was wide awake only a few moments before the passenger train passed. He had been in the service seven months. The conductor of the freight train is censured for not having advised the train despatcher of his movements. The operator at D was authorized by the despatcher to clear his fixed signal for the passenger train. The conductor and the flagman of the freight had been on duty 16 hours and 59 minutes, their train having been delayed 11 hours and 48 minutes by the breaking down of a car. The operator at D and the despatcher are held blameless, for the reason that the delayed freight was not obliged to come to D to clear the passenger train, but could use a side track between D and the point where the breakdown occurred. Both despatcher and operator therefore were held justifiable in assuming that the men in charge of the freight would protect their train adequately by flag.

Collision No. 25 occurred within yard limits, and the responsibility is charged against the conductor and engineman of the northbound train and the engineman of the southbound. The northbound train, belonging to road A, was running on the track of road B, this being its regular route for a short distance within the yard. Its right on the track of road B was the same as that of a yard train—it must keep out of the way of regular passenger trains of road B. In this case the passenger train of road B was 1 hour and 50 minutes late, and the train of road A appears to have occupied the main track without being officially informed as to how late the southbound train was. The collision occurred at the diverging track where the northbound train was to leave the track of road B. A flagman was sent out to stop the southbound train, but he did not succeed in doing so. Either he did not start

soon enough or did not go far enough, or else the southbound engineman did not properly heed the flagman's signals. The report is inconclusive, because of a disagreement between the officers of the two roads as to the facts in the case and the conditions governing. Under the rule the southbound train should have approached this junction with speed under full control.

The train at fault in collision No. 26 was an eastbound regular freight holding an order to run 10 minutes late. It ran only three minutes late. The engineman says that he trusted to his memory that he was due at F at 7:39; whereas that was the time by a time-table which had expired, and the correct time was 7:49. The conductor says that before reaching F he examined the time-table, but by mistake read the time against T, the next station west of F.

Collision No. 27 between a southbound regular and a northbound extra passenger train, occurring about 10 p.m., badly damaged both engines and destroyed three cars carrying passengers. One passenger was killed and 75 passengers and seven trainmen were injured. The northbound passenger train was running on a telegraphic order, according to the terms of which it should have kept clear of the southbound. The primary reason for its failure to do so, according to the report, was the mistake of the conductor in reading the time by his watch. He says that he gained the impression that he had 15 minutes more time to reach F than actually was the case. The trains met on a curve at speeds estimated at 30 or 40 miles an hour. The conductor's explanation of his mistake with the watch was that while his regular watch was being repaired he carried one in which the dial was in a different position as related to the top of the case; but it appears that at the time of the accident he had resumed the use of his own watch, and had been carrying it for several days. This conductor had been in the service 16 years. The engineman was also at fault for disregarding the time order, but the report has no reference to his testimony, as he was badly injured and was confined to the hospital.

Collision No. 29 was due to the careless misplacement of a switch by a brakeman. A westbound freight train stood on the siding waiting for an eastbound passenger train to pass. While it stood there the front brakeman of the train went to the switch, some distance forward from the place where the locomotive stood, unlocked it, and turned it so as to let the passenger train enter the side track. The passenger train came on at about 50 miles an hour and collided with the freight engine. Both engines were very badly damaged, and the first two cars in each train were demolished. Two mail clerks, one engineman and one fireman were killed, and 30 passengers and six employees were injured. The engineman of the freight is held blameworthy for not seeing that the switch near his engine was in the proper position; the passenger engineman is held blameworthy for not observing a semaphore signal which was in the stop position, warning him that the switch was wrong; the conductor and the fireman of the freight are also held responsible, as well as the engineman, and the fireman on the passenger train is held blameworthy for not co-operating with his engineman in keeping a lookout for the semaphore signal. The brakeman primarily at fault has been in the service three years, the passenger engineman 23 years, and the others named two years or more each, except the passenger fireman, whose term of service has been only eight months. The semaphore which was in position to warn the passenger engineman that the switch was in the wrong position is situated exactly opposite the switch and is 18 ft. high. It moves simultaneously with the switch. It was clearly visible for many hundred feet, the line of the road being straight for two miles west. It had been in the warning position two minutes or more before the passenger train arrived.

Collision No. 31, occurring at 12:10 a.m., and causing three deaths and 23 injuries, was due to the mistake of an engine-

man in reading an order. This engine was running without a train and there was no conductor. It was running west, backward, and met an eastbound passenger train at a point where, in consequence of a curve in the line and a hill on one side, there was a very short view. The three men on the engine of the passenger train, engineman, fireman and pilot, were killed. The westbound engine had been standing for some time at L, on a side track, about 1,200 ft. west of the station. On receiving from the telegrapher at the station an order to run to the next station, the engineman directed the fireman to set the switch for the movement to the main line. After this movement the fireman reset the switch for the main line and the engine proceeded. While waiting on the side track the engineman had made some repairs to his engine, one of the driving-wheel springs having got slightly out of place; and in the explanation which he gave after the collision he says that while at work on the engine he sustained a blow by a hammer on his forehead and that, temporarily, he lost his memory; and that he had no recollection of receiving the order or of starting his engine, nor of the collision. The testimony of the fireman, however, indicates that at no time did the engineman behave otherwise than in a rational manner, nor had he said anything to the fireman or to the telegrapher (who delivered the order) about having been hurt.

The order directed the engine to run from L to P, but to meet the eastbound passenger train at L; that is to say, the movement to P could not be begun until after the passenger train had arrived at L. The engineman proceeded, however, in precisely the same way that he would have done had there been no meeting clause in the order.

This engineman is 29 years old and had been in the service of the company about nine months, with a satisfactory record up to the time of this collision. He was thrown out of the cab and sustained some injuries. He had been on duty about 16 hours and 30 minutes. His regular hours of duty on that day were from 7 a.m. to 7 p.m., on a pushing engine, but he had been delayed about two hours on account of a blockade of trains due to the failure of the boiler of a locomotive.

The very heavy loss occasioned by this collision is due in part to the destruction of six passenger cars by fire. When the train came to rest after the collision, one of the cars was standing immediately over a large mass of burning coals which had fallen out of the firebox of one of the engines, and before it was possible to extinguish the fire an acetylene tank exploded, spreading the fire and rendering it uncontrollable.

Derailment No. 1 was due to a broken rail. The engine passed over the track at this point in safety, but the engineman felt a jar and applied the brakes so that his train was stopped in about 900 ft. The first seven cars of the train were derailed, and the eighth and ninth (the last) were derailed and overturned. The rail was of a size weighing 100 lbs. to the yard, and was 33 ft. long, laid in 1904. There was a flaw near one end. It appears that the rail had been broken by a train which passed over the track about 30 minutes ahead of the one which was derailed. In this leading train some disturbance was noticed by a messenger in the tenth car, and also by the conductor. The conductor pulled the cord to give the whistle signal in the cab of the locomotive to stop the train, but the air pipe through which this signal would have to be effected had been broken, evidently at the time the train passed over the broken rail, and therefore no signal reached the engine. The disturbance lasted only two or three seconds, and as the train ran on smoothly the conductor did not attempt to apply the air-brakes; but he went to the rear to consult the rear brakeman, and the train ran more than a mile before it was stopped, the stopping being finally effected by the automatic application of the air-brakes, due to the bursting of an air hose, caused primarily, no doubt, by something flying up from the track at the time the broken rail was passed. At the same time several pedestals and journal boxes were broken. The flagman of this train was sent back to search for the defect or obstruction, but he did not reach

the point of trouble until after the following train had passed over the broken rail and had been derailed.

Derailment No. 4 is attributed to faults in the tender of the locomotive. The report says: "The speed of the train was about 45 miles an hour. The tender was about half full of water, and contained about 18,000 lbs. of coal, placed mostly toward the back of the tender, and therefore resting principally on the rear truck, leaving the front truck with a light load only. The center of gravity of the tender is high. The vertical oscillation or galloping of the tender, due to unevenness in track, would tend to still further decrease the weight on the front truck; and this, together with the swinging or rocking of the tender allowed by the side-bearing clearance, which was slightly excessive, caused by the intermittent soft spots or imperfections in the low rail of the track, further influenced by the surging of the water in the tender, would at the moment when these effects acted in the same direction produce side strain sufficiently intense to relieve some of the wheels of their load, and even lift the wheels, and naturally would first affect the guiding wheels of the truck having the last load, which in this case was the first pair of wheels.

"This derailment can only be attributed to the combination of all or part of the effective causes named. This conclusion is borne out by the fact that there have been quite a number of mysterious tender derailments where the leading wheels left the track, not only on our own railway, but on others; and while opinions have varied somewhat as to the cause, in many cases it has been attributed to what might be termed the synchronism of the different motions of the tender itself and that of the engine, with the undulations produced by track imperfections."

ELECTRIC RAILWAYS.

On electric railways there were reported 53 collisions and 13 derailments, in which the total damage to rolling stock and roadway was \$19,316. In train accidents five passengers and one employee were killed and 209 passengers and 22 employees were injured. Accidents of other kinds bring the total casualties up to 26 persons killed and 642 injured. The largest item under the head of accidents other than train accidents is that showing the persons killed (seven) and injured (305) in falling from vehicles or while getting on or off vehicles; and these were nearly all passengers.

FOREIGN RAILWAY NOTES.

Residents of the province of Hunan, China, are prepared to furnish funds for the construction of a line through that province.

The Spanish authorities have granted permission to the Sociedad Anonime Tranvias de Valladolid to electrify its lines and to do a freight business.

It is said that improvements are to be carried out on the Japanese railways, broadening the gages to standard, and constructing new lines and extensions.

At Muggia, Austria, March 31, a passenger train was blown off the track by a tornado. The cars fell down a bank and were wrecked. Four persons were killed and 18 injured.

The plans submitted by the directorate general of railways of the Argentine Republic for building an 88-mile section of the railway from Embarcacion to Jacuiba have been approved. The estimated cost is \$2,922,400.

Japanese foreign trade in January amounted to \$16,000,000 in exports, two-thirds of the increase of \$3,000,000 being due to manufactured articles, and the imports \$19,700,000, an increase of \$5,000,000 due to increased cost of raw materials received.

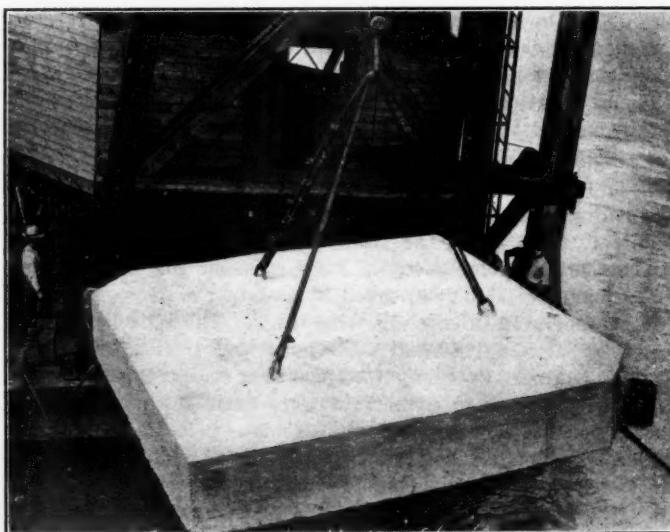
Contracts have been awarded for the building of a line from Montallegro, Italy, to Siciliana. This line will form part of a through line from Sciacca to Porto Empedocle. The contracts were let to Italian firms, but the carrying out of the work may necessitate the purchase of some materials from firms outside Italy.

The imports from the United States into Mexico through the port of Nuevo Laredo are showing a decided increase this year. On March 24 the imports amounted to \$107,000. This increase is partly due, probably, to the large quantities of wheat and corn which, under the suspension of tariff duties on the latter and reduction on the former, are finding a market in Mexico.

The Japanese Diet has cut from \$150,000 to \$100,000 the appropriation asked for by the Department of Communications for the purpose of investigating hydro-electric potentialities in Japan. Meanwhile the interest in electric enterprise seems to be growing. There are six electric railway projects now being considered in Osaka, including one to Kyoto, three to Kobe, one from Nishinomiya to Kobe, and one from Osaka to Nishinomiya.

SOME ENGINEERING FEATURES OF THE DETROIT RIVER TUNNEL.

In the issues of the *Railroad Gazette* for Feb. 16 and 23, 1906, there was published a description of the method to be pursued in the construction of the tunnel for the Michigan Central, under the Detroit river between Detroit, Mich., and Windsor, Ont. The method originated with W. J. Wilgus and has been executed by W. S. Kinnear as chief



Concrete Anchor.

engineer. It was the novel one of constructing tubes in the form of steel shells; sinking them into a trench dug in the bottom of the river; uniting them end to end; embedding them in a concrete casing and finally giving them a concrete lining. No compressed air was to be used in the subaqueous portion of the work except for the divers by whom the bolts, fastening the ends of the tube sections together, were placed.

In considering this plan it must not be confused with that of sinking independent caissons that were joined end to end, as in the case of the Metropolitan Railway under the Seine at Paris. There the regular caisson method of sinking was followed, using compressed air in the usual manner. The caissons were independent sections to be sure and were afterwards joined together to form the tunnel. The Detroit tunnel, on the other hand, was formed by excavating a ditch across the bed of the river, setting a core in it and filling

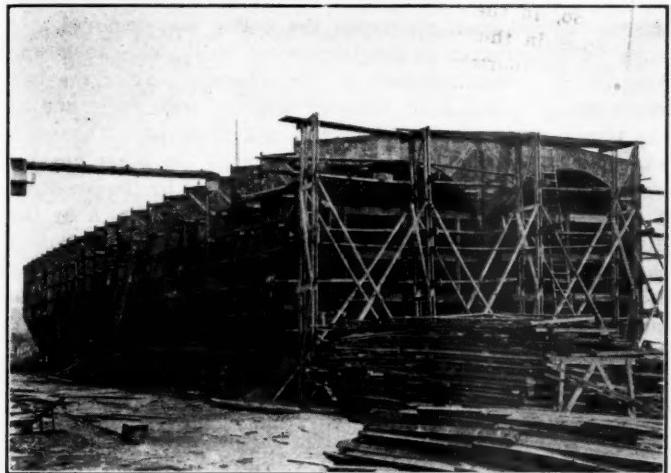
around with concrete, no caisson work being done at all. The evolution of the idea is interesting and direct. The water in the river is 50 ft. deep in places and it was the natural desire of the engineers to keep as high as possible so as to avoid long or heavy approach grades; and so, when studying the situation, regrets were expressed that the bottom was not of rock so that the minimum of cover could be used. This suggested the excavation of a trench and filling it with an artificial rock (concrete) and then tunneling through that. But why tunnel? Why not sink a core and

the resourcefulness of the engineers to the utmost in order to reach a successful consummation. These problems cropped up from the very start. They began by presenting unexpected difficulties in the excavation of the trench in the bottom of the river in which the tubes were to be laid. The greatest depth of water at the point of crossing is about 50 ft. and the excavation was carried some 22 or 23 ft. below this, or 74 ft. from the surface. A bucket dredge was equipped to work to 40 ft. and did excellent work, taking out 1,500 cu. yds. per day. It was the intention to let this dredge lead and follow with a clamshell for the balance, but when the latter was set to work it was found to be unsuited to the task and that, at the rate which it could dig, the time required would be so long as to place it outside the pale of consideration. The first step, then, was to reconstruct the bucket dredge and adapt it for working to depths of 60 ft. But, although braces and strengthenings were added, breakages occurred to such an extent that the idea had to be abandoned. This was especially caused by the breakage of the spuds and the great expense attending the same. The solution was found in the designing of a special clamshell capable of removing 700 cu. yds. per day of 12 hours on an average with a maximum output of 1,200 cu. yds.

The material to be removed from the river bed and from the approach tunnels was a stiff blue clay, and the total net quantity was about 700,000 cu. yds.

The methods of removal were dredging from the river bottom and tunneling both with and without a shield in the approaches. It was thought at first that the drifts could be driven without using compressed air and some of the work was done in that manner for the center wall. A drift was first carried forward for one of the lower quarters and that section of wall built, then the next lower quarter was removed, after which the two upper quarters in succession. A part of this, as already stated, could be done without air, but for much of the work air under pressure of from 10 to 20 pounds or even more was required.

One of the points brought out in this work was the action of this stiff clay in its production of pressures. Stated in a general way, it was found that these pressures closely followed what would have been produced by a liquid having the specific gravity of the clay. With the depth of cover beneath which the workings were carried this created an

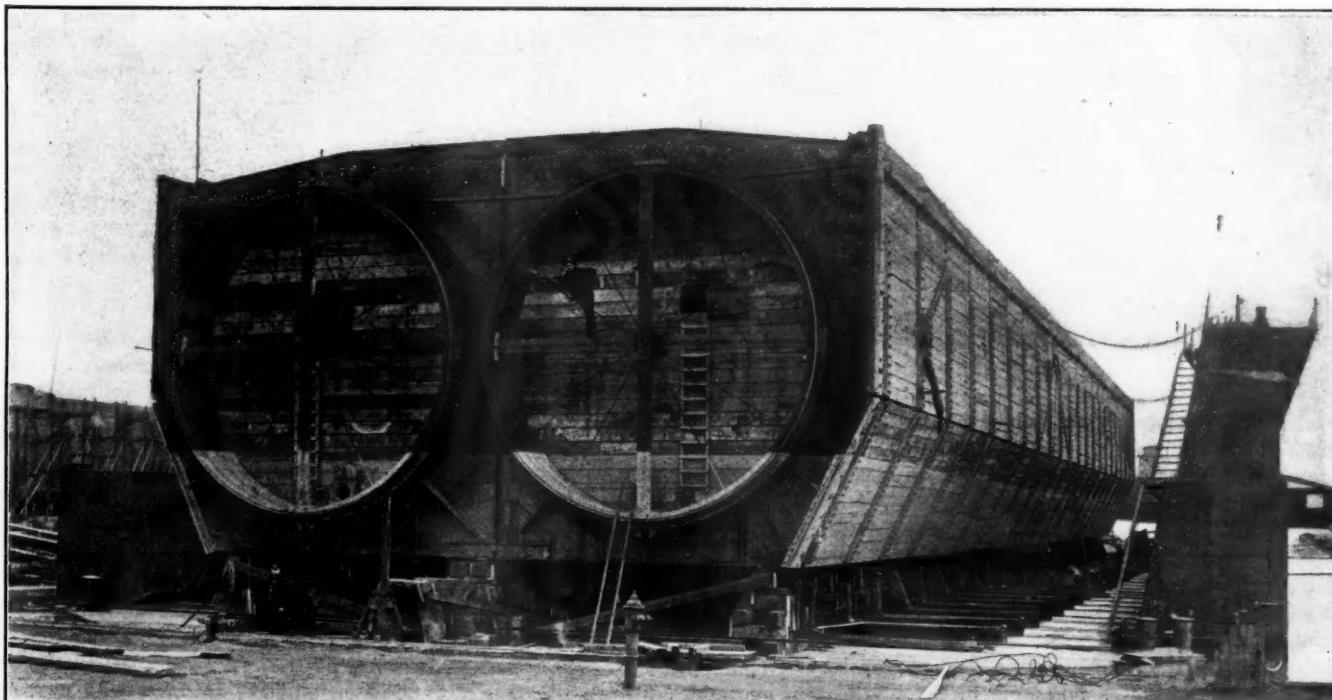


TUBES ON WAYS BEFORE SHEATHING.

form the concrete around it? That was the birth of the idea and the completed tunnel is the result.

The scheme, simple as it appears in outline, was novel and daring in the magnitude of the undertaking and the depths of water to be encountered, but the results have fully justified it, for the completed work is dry and considered by its engineers to be one of the strongest subaqueous tunnels in existence.

While the general scheme was one of simplicity itself, it is evident to anyone versed in such matters that, in its execution for the first time, problems of novel character would be constantly arising, the solution of which would tax



TUBES IN DRY DOCK.

enormous pressure; a pressure which, it was found, followed the law of liquids and increased to the bottom. Taking this broadly some of the physical difficulties of the work may be appreciated.

Surface indications of the flow of this material were followed closely and some interesting manifestations and con-

identical with those previously cited, as the bank on which the building stood was one side of a cut. Adjacent to the brick building was a low shed of no great value. When the tunnel was carried beneath it (the shed) the bank settled about 6 in. Before driving the heading along the building a pile of gravel whose weight was nearly equal to that of the bank was heaped upon the tracks immediately over the line of the tunnel. This load confined settlement to a small area, caused the breaking away of the section loaded from that underlying the building and checked the flow of the material, with the result that the maximum settling of the building was less than $\frac{1}{2}$ in. and no cracks were formed in the walls. After the tunnel had been completed the gravel was removed.

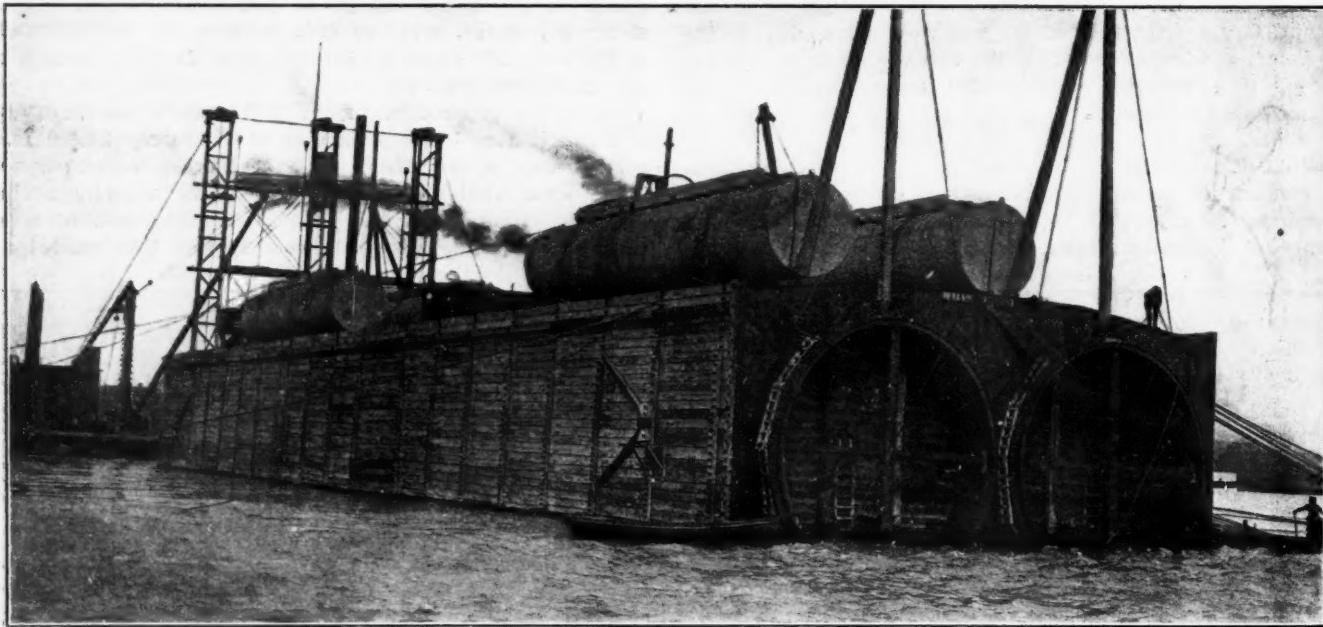
So, in the excavation for the center wall. The work was done in the order indicated on the diagram. After the two lower quarters had been removed and the wall built one of the upper quarters was taken out and timbered. The work was heavily done and stood all right until the other quarter was removed, when the timbering was crushed by the pressure. The suggested explanation of what happened is shown by the illustration. When the timbering was put in, the clay arched over and the two ends rested as indicated by the full line on the remaining quarter and the side. But, when the fourth quarter was removed, the arching took the form indicated by the dotted line, so greatly increasing the load on the timbering that it was crushed.

A final instance of this earth pressure may be cited as shown by the behavior of the timbering in the shafts. When they were first put down they were timbered far more heavily than the contractors considered to be necessary; but, as the work proceeded, even this proved to be insufficient and had to be increased. No measurements of the pressures actually obtaining were made, so that the work leaves no record other



Launching Tubes.

clusions therefrom were obtained. For example, the present line of the Michigan Central approaches the river through a cut, and the tunnel line passes beneath it on a slightly divergent line. At one point the center of one of the tunnels is directly beneath one of the main tracks, while the



Tubes Ready for Sinking.

other is beneath the slope of the cut on one side. The increased weight due to the height of the bank above the track caused it to settle very noticeably, but to a varying degree to a vanishing point out on one side, while there was no settling at all of the track on the lower level. In fact, it was not resurfaced during the whole of the work. It seemed as though the settling of the bank had raised the track enough to compensate for its own settling and held it to grade.

That this is so appears to have been proven by the behavior of a bank upon which a four-story brick building was standing and near which the tunnel passed. The conditions were

than that of the experience. But this is of such a character as to demonstrate that the usual formulas for earthwork pressures were sadly awry in this instance.

In carrying out the excavations on the land sections to the union with the subaqueous portion two distinct methods were employed. On the Detroit side of the river a shaft was sunk at a distance back from the shore, from which the land end of the approach was driven. Outside of this a heavy coffer-dam was built and the excavation carried in the open back to the shaft. The dam was formed of 8-in. by 16-in. piling, built to tongue and groove and filled in with clay between walls.

At the Windsor end, the tunnel was carried out to the point of union with the subaqueous section, and then the trench excavated up to the face of the work, and the tubular section attached when sunk.

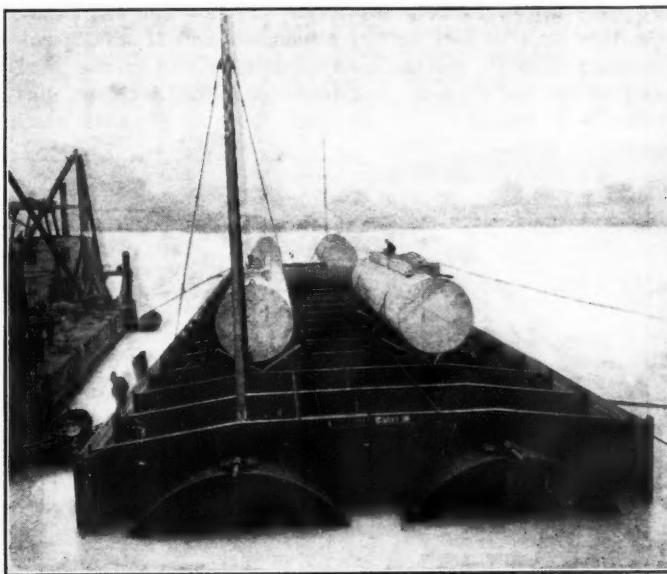
In all of the approach tunnel work there was nothing novel in the methods of procedure. The work was along lines that had been tried before, and was subject only to such changes as local conditions set up; so that, aside from the special problems that had to be solved it is about the subaqueous section that the real interest centers. The details of these sections had, of course, to be carefully worked out and all conditions were provided for as far as possible. They were designed to be built on the shore, launched like a ship and towed to their location. According to this plan they were built upon the regular ways in the regular manner. It so happens that the method of launching on the Great Lakes differs from that of the coast. It is customary to launch ocean-going ships stern foremost, but all lake vessels are launched sideways or broadside on, for good and sufficient constructional reasons. Hence these tubes were built parallel to the shore and launched in the usual manner. With the sheathing up the sides, as shown in the photograph, they offered a much greater resistance to the movement of the whole into and through the water than a ship with its partially rounded hull and greater buoyancy. It was because of this and especially because of the latter deficiency that trouble was experienced, by sticking on the ways and not getting into the water. This trouble was overcome by carrying the sheathing back beneath the tube in the form of a flooring for a distance of 15 ft. from the outer edge, as indicated on the engraving. With this flooring on our space was formed at the outer edge and the buoyancy correspondingly increased. This not only decreased the angle at which the tubes left the ways, but the increased buoyancy lifted them out of the water and so brought about a material lessening of the resistance to movement through the water. It was a matter of no moment whatever, whether this flooring was water-tight at the joints or no, for the movement was so rapid that, under the worst of conditions, sufficient water could not leak in to do any harm either by lowering the buoyancy or increasing the resistance to the motion. Before this precaution was taken some of the tubes were slightly damaged in the launching and had to be sent to dry-dock. Afterwards there was no trouble whatever.

After the tubes had been launched they were towed about 50 miles down the river to location and there sunk. In the towing there were no difficulties encountered other than those that would naturally arise in the handling of so large and unwieldy a vessel. The sinking, too, was easily accomplished, though it involved the exercise of great care and skill. In this the river currents played an important part.

It has been found that, in all streams, where accurate current measurements have been made, that the greatest velocity is not at the surface, but a short distance below it, showing that the resistance of the air and the wind sets up a frictional opposition to the flow that modifies it. This was found to be true in a general way in the Detroit river. The current velocities varied from point to point, according to the distances from the bottom and the shore, as well as according to the direction and strength of the wind. The figures given, herewith, can, therefore, only be regarded as approximations. The average surface velocity may be taken at 2.3 ft. per second, increasing to about 2.33 ft. a short distance below the surface and then gradually decreasing to about 1.61 ft. per second at the bottom. It was in this current then of approximately two miles an hour that the tubes had to be sunk. They had to be sunk to a true vertical and horizontal bearing. Their alignment with each other must be exact, and they had to be held accurately in position during the whole process of lowering. No definite measurements were taken of the strain on the holding cables imposed by the current impinging against the exposed sides of the tubes. They were

located broadside to the current and the upstream side measured 260 ft. by 29 ft. As velocities of 3.4 ft. per second were observed, this will be taken as the maximum which, if distributed evenly over the whole surface, would produce a pressure of 62,275 lbs., which, with the swaying of the tubes, might well run the load up to from 35 to even 40 tons. As the tubes approached the bottom, the load decreased until at the low velocity of 1.17 ft. per second found in some places it fell to about 7,775 lbs. With these stresses to be carried it is evident that a firm holding was necessary. The ordinary heavy ship anchors were found to be quite inadequate. They were dragged along the bottom by the pull and had to be abandoned. In their place, slabs of concrete from 10 ft. to 12 ft. square and 18 in. thick were formed, fixed in the bottom of the river, and the anchor lines built into them. An ordinary snatch block in these lines with winch engines on anchored and stayed scows was found to be sufficient to hold the tubes in place.

Before starting to sink the tubes grillages were sunk into the trench, and spaced so as to form a bearing and support for the adjacent ends of the tubes. These grillages were formed of 12-in. beams, and were carried on spuds or spurs



Tubes Partly Sunk.

that were driven into the bottom. They were lowered into place and then tapped with a pile driver until they were slightly below the level that the bottom of the tubes was to occupy.

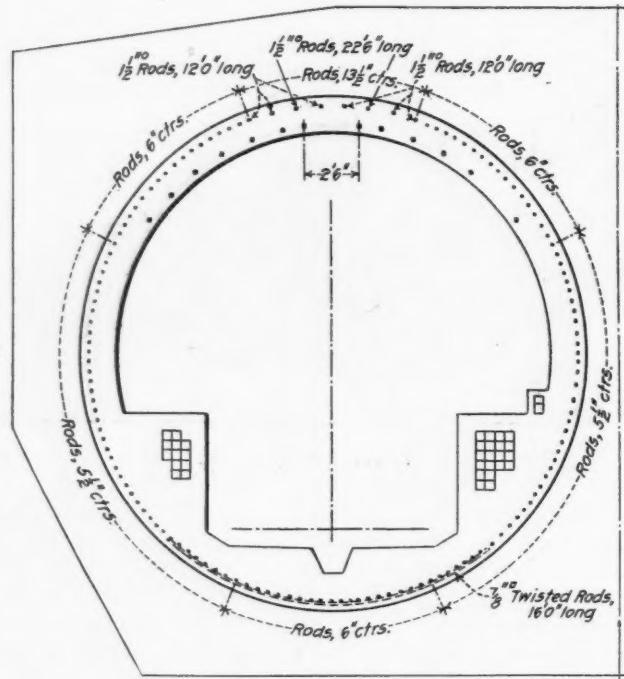
These preparations made, everything was in readiness for the sinking of the tubes. For floating down the river bulkheads had been built into each end, and every alternate tube was fitted with pressure bulkheads capable of sustaining the pressure due to the head of water. They were towed to location and valves in the two ends were opened and water admitted. As they filled the water naturally accumulated at one end more than at the other and that end settled the faster. The tubes were prevented from up-ending by semi-bulkheads built down from the tops of the tubes into the interior, as indicated on the sketch. Then, as the tubes tilted air pockets were formed in the lower ends, adding to the buoyancy at that point and maintaining an equilibrium. Independent air cylinders were placed on top, so as to keep the whole system on the surface when the tubes had been entirely filled. The balance was very even and the whole was so slightly lighter than the water that it would have floated with only these auxiliary air cylinders just above the surface. The second sinking was done by lowering a grillage of beams or counterweights down on top of the tubes by means of a floating derrick. As the supporting ropes

for this were eased off the weight depressed the tubes, and as they were tautened they came up. The weight so supported was about seven tons, so that by carrying a portion of this seven tons on the hoisting ropes, the whole 550 tons in water or 975 tons in air of tubes were fully controlled.

The leveling and alinement of the tubes was done by means of masts rising above the surface and by transits and levels on the shore.

As already stated, the supporting grillage at the bottom was driven down to a level slightly below that of the bottom of the tubes. When the latter were lowered to place, a diver was sent down, who placed wedges on the grillage, by which a proper footing for the tubes was formed. The latter were supported at or near the ends only, and so accurate was the leveling of this whole piece of work done that there was no perceptible variation from true from one end of the tunnel to the other.

The alinement was, if anything, an even simpler matter than the leveling. Four heavy projecting pins were fastened into one end of the tubes. At the other end corresponding holes were formed. Then a line was led out from the tube already down and into the one being sunk. As the tube went down this line was overhauled, drawing the tubes together, until the pins on one entered the dowel holes on the other, when the two were drawn forcibly together. This set one end of the new tube in true and perfect alinement, and it was merely necessary to shift the easily-handled outer end of the fresh one into line and the work was done. A curious incident, illustrative of the ease and at the same time the difficulty with which

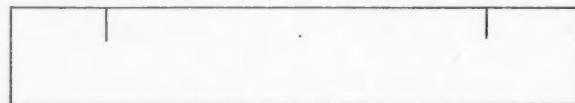


Reinforcement at Tube Joints.

these tubes were adjusted occurred in connection with the sinking of the first one at the Detroit end. It had been brought to a firm abutment with the approach, at the shore end, but the outer end had swung nearly two feet out of line. Tugs were attached and every effort made to drag it along the grillage into place, but to no avail. The next morning the steamer from Cleveland came up the river at full speed without slowing down and raised such a swell that the tube was lifted from the grillage and, strange to relate, was dropped in exactly true alinement, so that it did not have to be moved, adding another to the unexpected freaks of inanimate things.

With the tubes down, the first step was to place the connecting bolts through the flanges, and this was done by divers, and involved the only use of compressed air in the subaqueous section. This was easy and quick work, although the men were working in deep water.

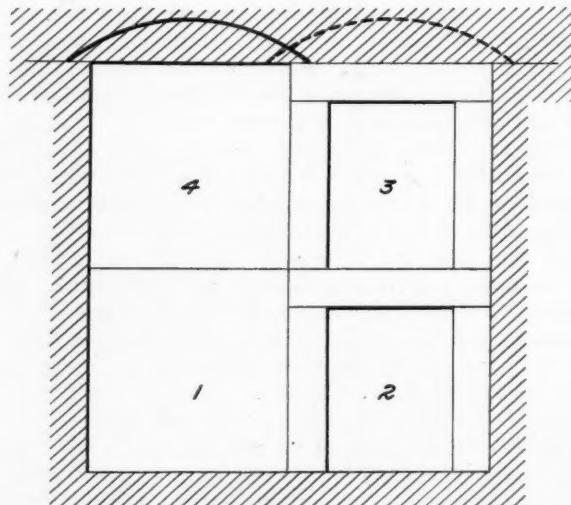
With the tubes down and bolted, it was necessary to imbed them in their shell of concrete before removing the water for the inside lining. It will be borne in mind that the tubes were carried on the grillage at the ends only; that they were clear of the bottom of the trench throughout the central portion, and that there was a clear space below them at the grillage at the ends. The concrete was deposited through a long chute from a tremie scow. As a matter of fact, the pressure of the superincumbent water was such that the concrete was very well compacted, and cores taken at a distance from the point of delivery showed that it was fully as dense and strong as that formed in the air, while in the immediate vicinity of the delivery chute, where it was subjected to the direct head of the



Sketch of Longitudinal Section, Showing Partial Diaphragms Used in Sinking Tubes.

mixture reaching to above the surface of the water, it was exceedingly hard and was some 50 per cent. stronger than the air-formed concrete. Owing to the depth of water and the improbability of interfering with navigation, coupled to the desirability of keeping the approach grades down as low as possible, the top of the tunnel is in some places above the natural bottom of the river. It is protected at such points by rip-rap, so that no anchor grappling it could possibly do any damage.

The forming of the concrete about the tunnels was controlled by the tremie scows above. In the first place a concrete floor of 1-4-7½ mixture was spread beneath the tubes. The excavation had sloping sides and the bottom was readily accessible. The floor A was thus formed up to the bottom of the tubes. This



Order of Excavation for Center Wall of Approach Tunnel.

firmly supported the tubes from end to end. Three tremies were then set to work to fill in and build up the concrete around the steel tubes. The sheathing at the sides served as the outer forms and the steel tubes as the core. One chute came down just inside the sheathing and one between the tubes, or at the points B, C and D. The concrete was sent down very wet so that it would flow and find its own level, and the chutes were raised as the space filled up. This formed a block of concrete of practically rectangular section with the two tubes running through it. The space between the sheathing and the slope of the banks was then refilled with clay, so that the tunnel stands embedded in the bottom.

With the concrete laid there was, thus, a column of concrete laid out into the river, abutting against the approach walls and capable of withstanding any end thrust to which it might be subjected. It was lined by the steel tubes and

cut up into compartments by the diaphragms in the latter. Then, as the work advanced, a section of the tubing would be freed from water, the temporary bulkheads cut away and the workmen would advance into it and put up the inner lining, or tunnel proper, working in the usual manner with wooden forms and without using any compressed air.

When the internal lining was placed a concrete mixing plant was erected on the shore at the head of the shaft, and the concrete sent down through a chute to cars on a temporary track in the tunnel. These cars were then hauled out to the point where the work was in progress. The mixture used was a 1-2-4 and was formed of Portland cement with sand and fine gravel.

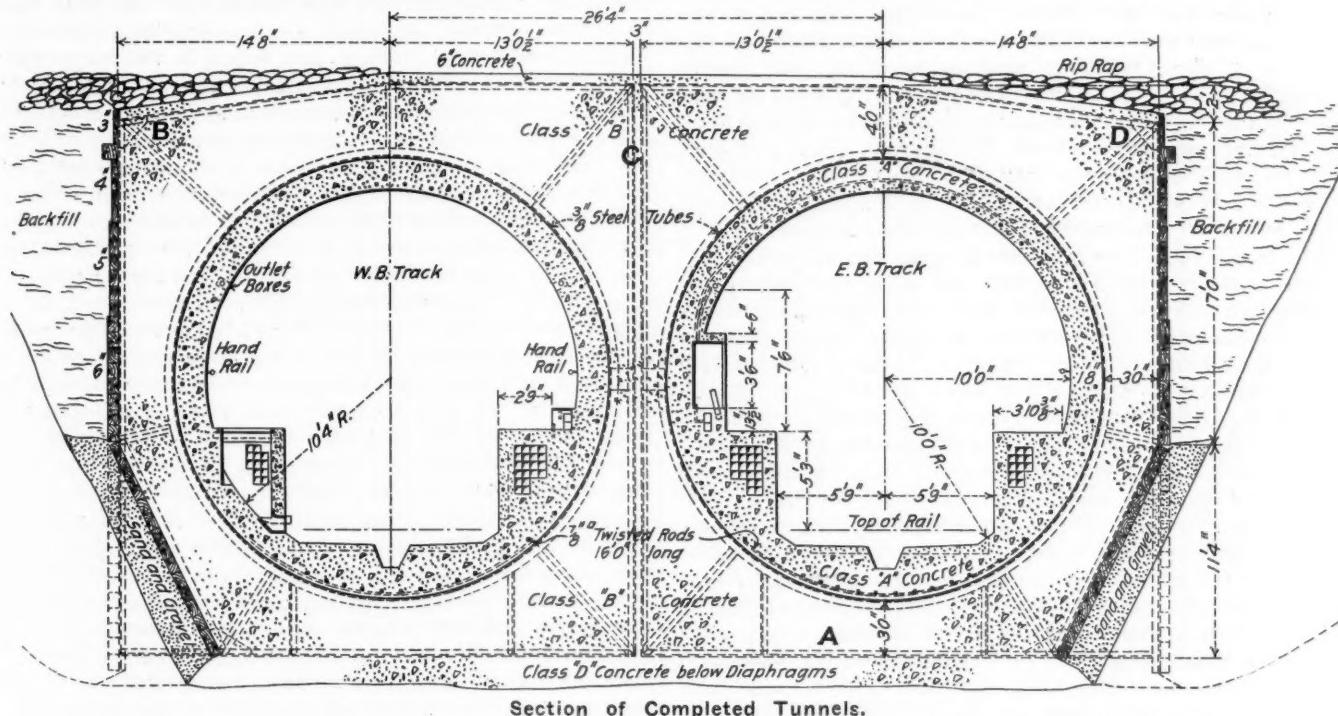
As already stated, the leveling of the tunnel was true, while the alignment was out but a fraction of an inch. The last tube dropped into place with exactly the calculated clearance between its end and the Windsor approach walls, which was about 18 in.

As it stands the tunnel is very dry. The steel tubes have served as a water proofing and are tight. In the approach tunnels the minor leakages are drying of themselves, and

rails to them with the intervention of tie plates. The rail used will be of 100-lb. section.

Outside on the Detroit approach the value of the ground is such that the natural slope could not be used, so that vertical concrete retaining walls are resorted to. But in Windsor the work in the approach cut resembles more the finished product of an old and prosperous road than what we are accustomed, in this country, to associate with a newly constructed line. The tendency of the clay to flow and the probability of trouble with a natural bank led to a complete drainage of the slopes. Drains are carried up at right angles to the track, and the whole slope has been sodded; then, at the bottom, there are tile drains to carry off the water so that no trouble is anticipated, and when the tunnel is opened to the public it will present the finished appearance, in whole and in detail, of an old and well-established line.

In the preparation of this article great assistance was rendered by Messrs. W. J. Wilgus, the advisory engineer; W. S. Kinnear, the chief engineer, and B. Douglas, the tunnel engineer, by whom the facts and data were contributed. All unite, however, in laying the burden of the credit for the suc-



in but one or two places will any attention be needed from the contractors. The novel method is, therefore, a success, and a similar plan is being used for one of the tunnels under the Chicago river, where a single section will be sunk. Its success, too, is not limited to its engineering features, but touches the financial side of the question, for not only has the cost been more than two million dollars less to the railway company than any other type of construction would have been, but it has been a profitable undertaking to the contractors.

In finish the section is one of the largest, if not the largest, subaqueous tunnels in existence. The conduit bench is large, roomy and with ample headroom. There is one upon each side and access is obtained by ladders set staggering at 50 ft. intervals, so that the trackmen have an opportunity to seek refuge every 25 ft.

The track construction is permanent and has been tested in service and under observation for more than two years in the open and has been found to be satisfactory in every particular (*Railway Age Gazette*, November 20, 1908, p. 1384). It is formed by embedding short wooden ties measuring 36 in. by 11 in. by 8 in. in the concrete flooring and spiking the

cessful completion of the work upon the shoulders of William Butler, of the Butler Bros. Construction Co., who were the contractors. As the contract was let, the work became a mutual affair. Instead of offering plans for a hard and fast design upon which bids were to be made and in accordance with which the work was to be done, four alternative plans were presented for competition. The contractors were asked to choose the one from among them that they preferred, or to bid on any other plan of their own; the conditions only being that a strong watertight tunnel should be delivered to the tunnel company. The Butler Company chose the one that has been used, and after having made their selection and submitted plans that were approved they were given a free hand to work out the details as they pleased. On them devolved the detail of the construction of the tubes, their sinking into position, the placing of the concrete and the meeting of the thousands of emergencies that were sure to arise, and that did arise with daily and hourly frequency, with all imaginable variations and inconceivable persistency. And it is in the meeting of these unexpected conditions and the resourcefulness shown in overcoming them that the engineers unite in giving the credit to Mr. Butler.

LOCOMOTIVE HEADLIGHTS AND OBSERVATION OF SIGNALS.

At the meeting of the Western Railway Club on April 19 the paper on "Electric Headlights," by Prof. C. H. Benjamin, of Purdue University, was read and fully discussed. As the paper presented the principal objections to high-power headlights, and as we published it in our issue of April 22, in the following abstract of the discussion the greater space is given to the remarks of those speakers who favored the electric headlight:

Professor Benjamin—I wanted to present this paper to the railway men because I know there has been a feeling in Indiana that our report must have been in favor of the use of electric headlights, and, while under the circumstances we did not feel justified in giving any opinion as to what kind of light should be used, we did give conclusions which I have read to you to-night, and I have seen no reasons since to change my mind, and believe that those conclusions have been substantiated by all the experiments that have been made.

H. T. Bentley (Assistant Superintendent Motive Power, C. & N. W.)—The tests reported agree practically with those made on our road by Professor Chamberlain and Max Toltz about two years ago. At that time there was a great deal of confusion of colors when an opposing headlight was placed in position so that the observers had it staring them in the face. In the Big Four tests, as reported by Professor Benjamin, the car was stopped at a predetermined point and the observers were called on to say what they saw. It would have been a very different matter if they had been traveling at the rate of 60 miles an hour and had been required immediately to make up their minds as to what was on the track, instead of leisurely taking the time and seeing for themselves at their convenience. The fact that false lights have been seen in these tests is a very serious matter, and the green light means "safety; proceed." Now, if the engineer is traveling at 50 or 60 miles an hour and sees a green light he is not going to stop, and this phantom light may be a very serious thing for the man on the engine. The obscuring of classification signals is also a serious matter, and I notice the observers could not distinguish them until they were within a few hundred feet. There are also other signals, such as hand signals, semaphores and block signals, all up for a certain purpose, to protect the engineer and the people on the train, and anything that will eliminate the effectiveness of those lights should be very seriously considered before it is put into use. After spending millions of dollars in putting up automatic block signals, everything should be done to keep the signal lights and indications so clear that there would be absolutely no excuse for a mistake. Before men become engineers they have to take examinations in vision and color perception, and if we go to that trouble to get men whose eyesight is absolutely correct and then do something that gives false indications, we are certainly working in the wrong direction. A headlight should give sufficient light so that the engineer could see people trespassing on the track, or other obstructions, or could have an indication that a train was approaching. I have ridden on engines where electric headlights were in operation, and while passing through the glare of the electric light I found that it was practically impossible to read the signals which should have governed. The dangerous part of the road is rounding curves, and the electric headlight does not do very much good, but a signal placed at such a dangerous location will help the engineer to know that everything is clear. It is said that where electric headlights are used on the prairies the cattle stand on the track dazed, notwithstanding the whistling and the ringing of the bell. In marine service more extensive and exhaustive tests have been made with electric lights than on railways, and it has been proved that a mist or rain acts as a curtain so that electric light will not penetrate to the same extent that oil light would. It is a serious breach of the rules for one steamship captain

to direct the rays of an electric searchlight at the pilot house of a boat opposing him for fear that some obscuration of signals will take place. It has been said also that it is possible with an electric headlight for a man to magnetize his watch, and I have seen reports of a creditable watch inspector to that effect.

W. E. Symons (C. G. W.)—The electric headlight was an innovation, but it proved so valuable on many lines that it was used for the combined purpose of improving the service and as an advertising feature, and there are roads where the electric headlight's strongest friends are in the passenger department. In the south, where there are stretches of timber 40 miles long, we were troubled by trains being stopped by trees which were blown across the track. We equipped passenger locomotives with electric headlights between Jacksonville, Fla., and Atlanta, Ga., which prevented numerous accidents where, with an oil lamp, the obstructions would not have been seen in time for the train to be stopped.

W. R. Scott (assistant general manager, Southern Pacific): It seems to me that in connection with the operation of trains and different kinds of headlights different conditions, circumstances and viewpoints should be considered. On lines that have been properly equipped with automatic signals and switch lights if there was any obstruction on the track other than a tree or something of that kind you would immediately have the danger signal, or if there was any switch misplaced or a car not in clear the same thing would obtain. Under these conditions it does not make much difference what kind of a headlight you have. The headlight is of more benefit to the man approaching than to the man behind it. It gives an indication of the train that is coming or the location of the train, and the man behind the headlight, if the road is properly equipped with signals and switch lights, can always read those at safe distances and correctly. There is no question but what the electric headlight is good in some cases and under some conditions, and it is likewise true that in many cases it is objectionable. On double track, where there is a density of traffic and where the roads are equipped as I have stated, I do not believe that any benefit could be derived from the electric headlight. On the other hand, on roads not so equipped, where obstructions should be seen in order to avoid accidents, the electric headlight will save in many cases. We have had some experience in getting false indications from electric lights on the roundel, and I can corroborate what has been said on this subject in the paper. It is only fair to state that notwithstanding you get a false light occasionally when the focus is not exactly correct, at the same time the signal blade can always be seen, so that there is no reason why the engineer would accept that as a signal and be governed by it, because he can always see the signal blade in plenty of time to read it properly.

M. A. Ross (Treasurer and General Manager Pyle National Electric Headlight Co.): This paper has brought out a good many facts that I have not come in contact with and some, for instance, phantom lights, I believe we should look into carefully. I cannot understand how they get some of these results unless the headlight was not in good condition. Under certain conditions the fusing of the bottom electrode, which is of copper and which we use to keep the focal points in the reflector, will show a green light. This is brought about by the speed of the dynamo being too high, so that it will heat up the copper to fusing point. This may have been the condition at more than 700 ft. I, myself, have seen a mile post 32 telegraph poles from the engine, and, after considerable experience with electric headlights, will say that they produce a clear view of the track practically as good as daylight for one-half to three-quarters of a mile. If the light is in correct focal position with the reflector you get no better results than

you would with an oil light, although you may have 3,000 candle-power, and if the copper electrodes fuse a little the focal point with respect to the reflector is too low, and it throws the arc up too high, and that will account for some of the phantom lights. As to the benefit of the electric light on curves, there is no doubt but what you can see the reflection from the headlight for a great many miles. I have been told that you can see it for 20 miles and that you can trace the location of the train by the direction in which the reflection is thrown, and collisions have been prevented by the observation of that reflection. The electric headlight came into use 15 years ago, and it has been gradually extended so that there are now something like 13,000 in use. Most of them, for some reason, are sent into the southern states, particularly into Texas, where they are so universally liked that their use has extended to nearly all the engines in that state. I understand that railway officers there are glad to put them on, as they consider them a good investment, and I do not know of any railway that has put on electric headlights of its own volition that did not find them a good investment. Ten or twelve years ago a test similar to the one described in the paper was made on the Big Four with colored lights, and we are unable to find any conflict in colors, and the officers of the Big Four were so well satisfied with the high power headlights that they equipped all their passenger trains with them and are using them yet. While these lights have not been used in the east to any great extent, in the states where they are using them I have yet to hear of any case where they have caused an accident. Any engineer that I have ever heard of who has used an electric headlight any length of time is very much in favor of it, and you will agree that engineers are not backward in objecting to anything put on their engines which they do not like or that would not be of benefit. Whether it would be wise to equip with the electric headlight engines in Indiana, Ohio and Pennsylvania, where traffic is dense and trains very frequent, I do not know, but that it is a great safety device has been demonstrated wherever used. In Georgia they require electric headlights on mail trains. In Texas they have been used for years on some roads without switch lights and they do not miss them. The engineer sees the position of the signal, and that, I believe, is the coming method of signaling on railways, because it is one which is absolutely positive and depends on position and not on the light. We all know how blinding it is to look into a firebox. One cannot see anything for a few minutes afterwards. But the fireman becomes so accustomed to it that after looking in it he will be able to read signals correctly at once. He knows how to adjust his eyes to such difficulties, and the engineers have their own way of doing this when they meet an approaching train. In the tests described in the paper everyone was looking directly into the headlights, and, naturally, would be blinded. An oil headlight would not blind because it would be too feeble. An engineer meeting an electric headlight will not look directly into it, but will get something between it and his eye, such as the corner of the cab, and this stops that blinding effect immediately. I have had 15 years' experience in putting electric headlights on engines and riding engines, being an old locomotive engineer, and I have never seen the time or condition when I could not see signal lights in their true color and true position.

T. R. Cook (Pennsylvania R. R.)—I was very much surprised myself at the outcome of these tests. We had markers put on the track at 2,000 and 3,000 ft. distant, as it was assumed that we could see them that far. But we were unable to see some obstructions at a few hundred feet distant. The actual position of the semaphore arms could be distinctly noted with sufficient accuracy to be distinguished without the use of lights. I have investigated the headlights and have had considerable experience with them in the past three or four years, and it appears to me, as the case now stands, we do not have to give any consideration to the electric headlight

as a headlight, that is, we can produce light in any given direction of any intensity with other means than the electric light, so that it is not a question of argument of an electric headlight against an oil headlight; it is a question of argument of intensity and distribution of the light we want. It is impracticable to get sufficient intensity of light to give the effect of daylight and allow the man to see the position of the signals without interfering with the absolute indication of colors.

W. C. Squire (W. E. Bossert Manufacturing Co.)—An ordinary headlight is 10 or 12 ft. above the head of the rail. That would make some difference in any observation, and the question of lowering headlights is important. On some roads they are dropped to the center of the front end, but the location of the headlight itself must have some relation to the position of the engineman who is looking at an opposing train.

C. P. McGinnis (traveling engineer, M. St. P. & S. S. M. Ry.): The electric headlight is helping the signal question to be resolved into one of position rather than color. I have noticed this in piloting new engineers over the line at night. I have asked old engineers about the colors of the numerous signals, and, to my great astonishment, practically all of them told me they did not know. They had only paid attention to the position of the blades, and I found that to be the only logical way to get the exact position of the switches where there are a great many lights together. I have counted as many as 23 lights within 200 ft., and these lights are come upon suddenly in rounding curves. I do not think there is any engineer that can pick out the right lights in order to tell just where he is going without slowing down too much to maintain schedule time, but he does carefully observe the signal blades. I find the electric headlight is a factor of safety in getting the train over the road. It assists in locating small stations so that the brakes are applied at the proper time. It is of especial advantage in winter time when snow forms outside the cab window. On an engine equipped with electric headlights this screen can be seen through without looking out of the side window. These few advantages that I have mentioned have caused our company to equip our passenger engines with electric headlights. It has been said that the electric headlight magnetizes the engineer's watch, but I have used a galvanometer and have not been able to detect a current 14 in. away. I have a watch which I think is a good one and it only varies about 20 seconds a month, though I have frequently been on engines equipped with electric headlights. I do not think that 2 per cent. of our engineers who are on engines equipped with electric headlights would care to have them taken off and replaced with oil lamps. In fact, when making some changes, engineers objected to taking engines not equipped with the high-power headlight.

Professor Benjamin: In closing there is one thing I wish to say, that from my observation both on this road test on the Big Four, and also in riding on the locomotive, I believe it is entirely possible to see ordinary colored signals if you are using headlights and have no opposing electric light at a distance of upwards of a mile. I do not think it is possible to see anything in the nature of a big tree, or anything of that character, no matter what color it is or how large it is, at a distance of much over a quarter of a mile, and this should have some bearing on the question of using semaphore arms instead of lights for safety or danger signals. Under ordinary circumstances any engineer can see the colored lights at sufficient distance to make him entirely sure of the condition of the road ahead of him, and he certainly cannot see the arms or blades at a sufficient distance so that he would be entirely safe in going ahead at full speed.

On motion of Mr. Manchester, the club authorized the executive committee to print an extra lot of copies of the proceedings of the meeting so as to make general distribution of them to the railways and the railway commissioners of the different states.

General News Section.

In a fire at Depew, N. Y., April 26, the storehouse of the New York Central car shops, together with a part of the machine shop, was destroyed; estimated loss, between \$60,000 and \$75,000.

Secretary Ballinger, of the Department of the Interior, has withdrawn from entry approximately 13,500,000 acres of coal lands in southeastern Montana, believed to contain valuable deposits, pending examination and classification as to their values.

The New York legislature has passed a bill, which has been approved by the Governor, providing for the issuance of \$7,000,000 in 4 per cent. bonds for the improvement of the Cayuga and Seneca canals. These canals are to be made a part of the barge canal system.

The battleship Indiana has been fitted with a brake with which, it is said, the vessel can be stopped in half its own length when going at good speed. The brake consists of movable wings which are attached to each side of the ship and which are controlled directly from the engine room.

The Colonial Creosoting Co., of Millsboro, N. J., which is a short distance west of Bound Brook, is to treat by the Lowry preservative process 400,000 ties for the Lehigh Valley. These ties are to be delivered during the present year, and the order may be increased. The Colonial works have a capacity of a million sleepers annually.

The Massachusetts Legislature has passed a law forbidding street railways, when allowing passengers to ride on the platforms, to require them to do so at their own risk. The proposition which was before this body, to impose fine and imprisonment on a railway officer violating the laws forbidding the merger of two railways, was rejected by the Senate without a word of debate and without a division.

The railways in Texas have notified the State Railway Commission that if reductions in their Texas rates on cotton are made as proposed they will be compelled to reduce expenditures for improvements. The improvements contemplated for the next two years aggregate \$25,000,000, but this may have to be cut down to \$10,000,000. The work planned includes about 150 miles of new line and large numbers of new cars and engines.

The railways doing interstate business in Oklahoma have appealed to the state supreme court from the order of the Corporation Commission requiring them to establish general offices in the state by June 1. They allege that the order violates the 14th amendment and the commerce clause of the Federal Constitution. They allege that the order requires them to vest the authority of a general manager in the hands of a local agent, which is unreasonable and unjust.

The evidence which has been obtained by W. J. Burns, a detective, in regard to alleged "grafting" in the repair of cars for the Illinois Central by outside companies, is to be turned over to John E. W. Wayman, state's attorney of Cook County (Chicago), with a view to starting prosecutions if it shall seem to Mr. Wayman that it furnishes ground for them. The evidence is now in the hands of the law department of the road, and officers of the company have indicated that they believe it is sufficient to secure some convictions on serious charges.

The western railways, as usual, are advertising widely that April 30 will be celebrated as "California raisin" day. The day will be celebrated throughout California, and the railways which are interested in traffic to and from that state have put up colored posters in their stations and other conspicuous places and are distributing numerous folders describing the raisin and how it is grown and cured and used. The Chicago & North Western and the Rock Island lines have announced that raisins will be served in various ways on all their dining cars on April 30.

An officer of the Hocking-Sunday Creek Traction Co., Nelsonville, Ohio, writes that the McKeen motor car will be operated exclusively on the line which is now under construction. One of the standard 6-cylinder, 200-h.p. cars has been in regular service since February 12, and has not missed a trip on its schedule, although the first run was made in 13 in. of snow, and although, about 10 days later, 8 in. of snow and a severe sleet storm tied up practically all of the traction lines in that section. When the line is finished six motor cars and six trailers will be used.

The Great Northern Railway is using telephones for train despatching on 2,100 miles of its lines and has ordered apparatus to be installed on six more divisions, the Fergus Falls, Breckenridge, Northern, Dakota, St. Cloud and Cascade divisions, a total of 1,900 miles. Western Electric telephones and Cummings-Wray selectors will be used, these having been adopted as standard by this railway. Two hundred and ninety stations are to be equipped, while 350 additional telephones will be installed at sidings and at stations which are not open during the whole 24 hours.

According to a press despatch from Harrisburg, Pa., one of the operating men of the Cumberland Valley has been arrested on the charge of tampering with a signal light. The report is denied by officers of the road, but it persists. Surprise tests made during the past three years have resulted in the discharge of several enginemen, and, it is said, they have now retaliated by causing the arrest of the man who conducted the tests, and he is understood to be out on \$3,000 bail. It is a criminal offense to tamper with signals, but whether a railway has the right to change signals in order to test the enginemen has never been tried out in the courts.

The Ohio committee of the Railway Business Association on Monday of this week laid before the Senate of that state a protest against the Woods bill for a public utilities law. The protest was signed by several hundred merchants and manufacturers of the state. Following its presentation, the committee on commercial corporations reported the bill, with important amendments, but without recommending its passage. On the floor of the Senate a motion to take up the bill this week was defeated, by a vote of 15 to 11, so that it is now at the bottom of the calendar, where it is behind 59 other measures.

The directors of the United States Steel Corporation have declared a quarterly dividend of 1 1/4 per cent. on the common stock, placing the stock on a 5 per cent. basis, as compared with a 4 per cent. basis. E. H. Gary, chairman of the corporation, issued a statement in which he said that conditions justified an increase, but that it was the opinion of the present members of the finance committee that future disbursements should be declared in the shape of extra dividends when earnings justify such increases. The net earnings for the quarter were \$37,616,876, comparing with \$22,921,268 in the corresponding quarter of last year. Unfilled tonnage aggregated 5,402,514 tons, comparing with 3,542,595 on the corresponding date of last year.

Dining cars and lunch baskets constitute, evidently, a subject of genuine "human interest," and the correspondent who last week suggested that a train ought to have both a dining car and a buffet did not exhaust it. Another writer, C. E. L., thinks reserved seats might be provided for. He says: On the important through trains, where the dining car has a conductor and a collector, or two men occupying similar positions, one looking after the financial features and the other acting as head waiter, why not have one of these men pass through the train, quietly and unostentatiously, and present his menu to the passengers, take their order and assign them a seat at a certain table, at a definite hour? Then he could have things ready for them at the proper time. The present

practice of announcing dinner ready and then running everybody in promiscuously, each in some other's way, is always confusing. The passengers get into the dining car or into the vestibules, only to stand there looking with eager and hungry eyes on the festive board and gambling as to which man is going to get done first and who will get his seat! What could be more uncivilized?

The new Forest Products Laboratory at Madison, Wis., is finished, and will be opened on June 4, 1910. A short program has been prepared for the opening exercises, and demonstration work will be in progress, so that visitors may make a satisfactory inspection of the plant. The testing which it is proposed to do here has been described in the *Railway Age Gazette*. It is hoped that those in charge will receive the co-operation of all wood-using industries. Within a month or two a number of positions in connection with the work will be filled with engineers of wood preserving, timber testing and chemical engineering. Candidates will receive consideration according to their engineering training and practical experience.

As a result of the negotiations incident to the strike of tugboat pilots in New York harbor, on April 1, the officers of the railways having to do with this feature of the railway service have formed an organization, called the Associated Marine Departments, with a view to conserving the interests of the licensed officers employed by the railways—masters, mates and pilots—whenever they are called before the United States inspectors, and also in case attempts shall be made to coerce or interfere with them while they are attending to their duties. The chief "general agent" of the new association is Captain N. L. Cullin, who seems to have been an officer of a union of these pilots. He has resigned his position in the union. The prime movers in the formation of the association were the Central of New Jersey, the Baltimore & Ohio, the Delaware, Lackawanna & Western, the Erie and the Lehigh Valley, the roads against which the men had struck, but it is understood that the other railways will give it their support. According to the *Marine Journal*, from which we take these facts, the railways have taken this measure, looking to a more intimate understanding between the employers and the employees, because there has been undue favoritism in the relations between the supervising inspector of the New York district and the man who led this strike. By breaking down this "unfair alliance" it was felt that an era of fair dealing could be brought in.

Telephones for train despatching are being put up on the line of the Norfolk & Southern between Norfolk, Va., and Washington, N. C., 136 miles. Gill selectors are used, these and the other instruments being furnished by the Western Electric Co. Besides the 20 stations, there will be eight booths at sidings fitted up with telephones for the use of conductors stopping at such sidings. Portable telephone sets are to be provided on some of the trains, so that by the use of a "fish pole" communication may be established with the despatcher's office at any point along the road.

The Virginian Railway has ordered Western Electric telephones and Gill selectors for the equipment of train despatching lines throughout its first and second divisions; and when this work is completed the entire line of this company will be provided with telephones for despatching. On the Third division, from Roanoke to Deepwater, the telephones are nearly ready to go into service. On the First and Second divisions, for which the apparatus has just been ordered, the bells at the stations will be rung by the current from a battery situated at the despatcher's office. Thirty-one stations will be thus equipped. This division will have 27 telephones at places other than stations.

Good Winter Service.

During the entire period of continuous cold weather, ice and snow from December 3 to January 17, not a single accident was reported and we did not find it necessary to cancel a single passenger train. There isn't another road in the territory which makes such a showing. We were handicapped,

too, by being short of power.—*Vice-President Ross, Chicago & Alton.*

Improvements on the Chicago & Alton.

By the time the Alton has spent 40 per cent. of the \$18,000,000 it is now raising by a bond issue there will not be a finer property in all the West. By the fall we will have in service thirty more heavy freight engines, ten Pacific type passenger engines and ten switching engines. We are now double-tracking between Bloomington and Atlanta, twenty miles, and between Iles and Nilwood, twenty-six miles, and bringing the maximum grade down to three-tenths. This work is costing \$900,000. This done, we shall be able to increase our trainload from 2,700 tons to 4,000 tons, without employing pusher engines. The Alton will then be double-track from Chicago to Nilwood, 210 miles. Between Nilwood and St. Louis there are several more sections of double-track, bringing the total to 232 miles.

"Shop capacity is being enlarged at various points. We are elevating our tracks in Chicago and Joliet. At Lincoln and Bloomington we are erecting handsome new passenger stations. At Peoria a large new terminal is being built by a subsidiary company of the Alton, and at East St. Louis we have consolidated the Alton's freight and engine terminal with the Clover Leaf's.

"On the Clover Leaf we have just finished grade reduction to 35 ft. to the mile at East St. Louis, going east to the Mississippi valley bottoms. This means an increase in the maximum train haul from 1,200 to 1,600 tons. The Clover Leaf is gravel ballasted except in the eastern division, where the ballast is rock. We have contracted for 50,000 yds. of rock for the eastern division, or about 33 miles of rock ballast.—*G. H. Ross, vice-president.*

Railway Matters in Washington.

Washington, April 27, 1910.

The next hearing in the government case for the dissolution of the union of the Southern Pacific and Union Pacific railways will not take place until October 1.

The Supreme Court of the United States has granted a writ of certiorari in the case against the Atchison, Topeka & Santa Fe concerning the working hours of telegraphers, which means a rehearing of the case.

The appointment of Governor Charles E. Hughes, of New York, to the vacancy on the Supreme Court, with the announcement that Governor Hughes will not take his seat in the court until October, is understood to make it certain that the Standard Oil and American Tobacco cases will not be taken up for rehearing by the court until the fall term.

The bill to amend the interstate commerce law continues to drag in both houses of Congress. In the Senate this week the leaders had nearly or quite agreed that a vote should be taken on May 7, but Senator La Follette, of Wisconsin, objected, and everything is again at sea until it shall be known how long a time Mr. La Follette's speech will occupy. On Monday Senator Doliver, of Iowa, delivered a long speech. It was devoted largely to politics. He presented, however, a cogent criticism of the proposition to have the Department of Justice take out of the hands of the commission the function of defending the government in rate cases, and also showed what inconsistency and uncertainty would be sure to arise under a law giving the commission power to change rates frequently. Stable rates are more important to the industries of the country than low rates, yet the Interstate Commerce Commission can order changes whenever it pleases; these orders expire by limitation at the end of two years, and the result will be perpetual unrest.

On Tuesday Senator Clapp made a long speech, and he and other senators kept up the talk for four hours, but it was mostly politics, and only a few senators gave attention to the speakers.

The executive committee of the National Association of Railroad Commissioners met here last week and discussed those provisions in the administration bill which are thought by some commissioners to threaten the power of the indi-

vidual states. One of these provisions is that giving the federal authorities power to regulate the issue of railway stocks and bonds. The railway commissioners of Minnesota appear to have been the originators of this alarm, and Commissioner Staples of that state remained here after the committee adjourned with a view to seeing that the Congressmen should not ignore his protest. It is said that the committee will ask the railway commissioners in all states to join them in their protest.

Congressman Sulzer, of New York, last Monday introduced in the House the railway rate bill which was introduced by Mr. Hearst in the Fifty-eighth Congress.

Proposed New Subways in New York.

The New York State Public Service Commission, first district, has prepared a form of contract proposed for the construction, equipment and operation of the Tri-Borough Subway route, in so far as that route is offered to private capital to build, equip and operate. This form is the forerunner of another covering the construction of the subway only and by funds derived from the sale of city bonds. It has not been decided which method shall be followed in the case of the Tri-Borough route, and the question will depend upon whether attractive bids are received on construction and equipment by private capital. A public hearing will be held May 9 on the form of contract first mentioned, and a week later a hearing will be given on a form of contract, to be published in the meantime, providing for the construction of the Tri-Borough route with city funds and the equipment and operation by private capital. This second form of contract will cover the Tri-Borough route in sections, and will follow the general form of the contracts for the construction of the Fourth avenue (Brooklyn) route, which have already been let.

Mayor Gaynor and other officers favor building the Broadway-Lexington portion of the Tri-Borough system with city money, and have set aside \$13,000,000 to start the work. Commissioner Bassett has filed a dissenting opinion against both proposed contracts, holding that the terms are not as attractive as they should be to bidders.

The Tri-Borough system includes the Broadway-Lexington line, from the Battery to 135th street, with one branch thence to Pelham Bay Park and another to Woodlawn; the Canal and Centre street routes in Manhattan, and the Broadway-Lafayette avenue loop in Brooklyn, crossing the Manhattan and Williamsburg bridges.

Ownership will vest in the city from the start, whether the line is built with private capital or city funds. In the private capital scheme the contractor would receive his recompense in a lease of the road for operation for a term of years long enough to enable him to amortize the cost of the road.

It is provided in the proposed contract form that work must be started within sixty days after the agreement is signed, and the entire route completed within four years. When one-half of the line is finished the contractor must begin installing the equipment, the road to be put into operation as fast as sections are completed. It is expected that work will be begun this coming autumn. Negotiations are practically completed with the Interborough company for the construction of extensions in connection with the tunnels to Queens and Brooklyn.

All work will be done in tunnel in Manhattan south of 138th street and on the Broadway-Lafayette avenue loop in Brooklyn, excepting the portion of Lafayette avenue east of Bedford avenue. The rest of the work will be in open trenches.

The right is reserved to the commission to allow other railways to use the tracks; the rate of fare is to be five cents for the entire length of the system; no part of the road or stations is to be used for advertising purposes.

The contractor must furnish equipment approved by the commission, and provide for the operation of 10-car trains at not exceeding one and one-half minutes' headway and averaging not less than 25 miles an hour, including stops. Cars must be of steel, and all the latest improvements in equipment are demanded.

It is provided that within three months after the contract is made, the commission and contractor shall each appoint

an engineer, and 30 days later shall agree upon a third engineer, and the three are to constitute a Board of Arbitration to supervise the entire work. If the commission and contractor cannot agree upon the third engineer, he will be named by the Chamber of Commerce.

The contractor must specify the exact terms upon which he is willing to operate the road for a period of years, based on the percentage of cost he is willing to set aside annually to amortize the cost. The term will depend upon the amount the contractor is willing to set aside each year, and therefore the bidding will be determined chiefly by the time clause of the different competitors.

Railways on Paper.

Between 1900 and 1908 the Canadian Parliament authorized 65 companies (outside of the Canadian Pacific, Grand Trunk, G.T.P. and Canadian Northern) to build over 37,000 miles of railway. Of this, not 500 miles has been built, and of the 65 companies granted privileges to build, only 13 have taken advantage of their privilege. Senator Davis has introduced in Parliament a bill to provide for the granting of railway charters by the Railway Commission instead of by Parliament. The Railway Commission would be in a much better position to check the feasibility of a scheme; to regulate the issuing of bonds, and to secure the building of the road according to requirements.—*Canadian Engineer*.

Timber in Brazil.

Consul-General Anderson, of Rio Janeiro, in a report to the State Department, says that the railways in Brazil have difficulty in supplying themselves with ties and timber, though in the northern hemisphere the country is popularly supposed to be covered with forests. It appears, however, that useful trees are greatly scattered, that some kinds of them are heavier than water, and so cannot be floated, and that, therefore, the cost of transportation is prohibitive. The Paulista Railway Company, the largest in southern Brazil, having 691 miles of track, has planted a nursery of eucalyptus and other trees covering 250 acres, besides conducting a number of less extensive experiments. Recently the company has bought land on which to plant a million more eucalyptus trees. It is expected that after a period of 15 years it will be found that eucalyptus large enough for ties will have been shown to cost about 15 cents a tree.

Free Relief for International Harvester Company's Employees.

The International Harvester Co., employing 25,000 men and operating factories, twine mills, lumber mills, steel mills, mines and railways, has announced the establishment of an industrial accident department similar to that announced last week by the United States Steel Corporation (page 1052). The new department begins operations May 1. The railways operated by this company are the Illinois Northern, the Chicago, West Pullman & Southern, the Owasco River and the Deering Southwestern. In general, the scheme is similar to that of the Steel Corporation. Further details, as given in a circular issued by the Harvester company, are as follows:

In case of death there will be paid three years' average wages, but not less than \$1,500 nor more than \$4,000.

In case of the loss of a hand or foot, one and one-half years' wages, but in no event less than \$500 nor more than \$2,000.

For the loss of both hands or both feet, or one hand and one foot, four years' wages, but in no event less than \$2,000.

In case of other injuries, one-fourth wages during the first 30 days of disability; if disability continues beyond 30 days, one-half wages during the continuance thereof, but not for more than two years from the date of the accident. Thereafter, if total disability continues, a pension will be paid.

Provision is made so that the employees may increase the benefits to be paid during the first 30 days of disability to an amount equal to half-wages. This is accomplished by the

creation of a benefit fund, to which employees earning \$50 a month or less will contribute 6 cents a month, employees earning more than \$50 and less than \$100, 8 cents a month, and employees earning more than \$100, 10 cents per month. These small contributions will, together with the one-fourth wages paid by the company, be sufficient to provide half-pay for all injured employees during the first 30 days of disability.

This arrangement for contributions from the employees toward paying the benefits for the first few weeks of disability is modeled after the German law, recognized as one of the most successful of European laws dealing with this subject. As a reason for desiring this contribution from the employees it is stated:

"The company earnestly desires the co-operation of its employees in the payment of benefits during the first 30 days of disability because it wishes every employee to assist in the prevention of accidents. The company has expended large sums in safeguarding machinery, and in the effort to protect its employees from injury, but without the active co-operation of the employees many accidents cannot be avoided. Under this plan the company and the employees equally divide the payment of benefits during the first 30 days of disability, and thus every employee becomes financially interested in guarding against accidents and in seeing that his fellow workmen are equally careful. It is hoped that this mutual interest will lead to active co-operation on the part of the employees, and that, thereby, accidents will be reduced to a minimum."

A comprehensive scheme for the administration of the plan is provided. A department known as the Industrial Accident Department is created. This is to be managed by a board of managers composed of five members appointed by the company.

Negotiations Concerning Wages.

Officers of the Delaware & Hudson, following extended conferences, have agreed with representatives of the several classes of brotherhood employees concerning an advance in the pay of conductors, trainmen, enginemen, firemen and telegraphers. The wages of the conductors and trainmen are to be adjusted in accordance with the award of the Board—Messrs. Clark and Morrissey—which has arbitrated the controversies concerning the same classes on the New York Central & Hudson River. The enginemen, firemen and telegraphers will receive an advance of about 8 per cent.

The Lehigh Valley, having some time ago settled the questions of wages of enginemen, firemen, conductors and trainmen, has made advances averaging 6 per cent. in the wages of its other employees, including the clerical forces. The new rates go into effect May 1.

The Central of New Jersey has increased the pay of several classes of its employees and is still negotiating with others.

Officers of the New York Central Lines west of Buffalo have agreed with representatives of the conductors and trainmen to submit their questions concerning wages and conditions of work to Messrs. Clark and Morrissey, the same arbitrators who have been chosen for a similar function on the New York Central Lines east of Buffalo. On the Cleveland, Cincinnati, Chicago & St. Louis an agreement for an increase in pay has been reached with the Brotherhood of Locomotive Engineers.

Officers of the International Order of Railroad Machinists are asking for an increase of pay for machinists on most of the prominent roads west of Chicago.

The Erie has advanced the pay of firemen an average of 8.2 per cent. The firemen on the largest passenger engines will receive \$2.90, and on the heavy freight engines \$2.60. The pay of enginemen, telegraphers, switchmen and freight handlers already has been adjusted. Negotiations with the conductors, trainmen and shopmen are still pending. The order concerning firemen takes effect as of April 15. It is the result of a ten-days' conference.

The Southern Railway has made an increase of 3½ cents a day in the pay of members of the Brotherhood of Carmen. The membership of this brotherhood includes car builders, car repairers, car cleaners and others.

The Southern Railway and the Order of Railway Telegraphers have joined in choosing arbitrators to adjust the wages of telegraphers on the company's lines.

The Seaboard Air Line and the Southern Pacific have agreed with representatives of the telegraphers on their lines to refer to Messrs. Knapp and Neill pending controversies concerning wages and working conditions.

The Wheeling & Lake Erie has increased the pay of machinists, boiler makers, blacksmiths and other shopmen; 8 per cent. for the skilled laborers and 6 per cent. for others.

The brotherhoods of conductors and brakemen announce that they are conferring about increases of pay with the Pennsylvania, the Philadelphia & Reading, the Central of New Jersey, the Erie, the New York, Ontario & Western and a number of other lines. It will be recalled that on the two roads first named general advances in pay have just been ordered.

Corporation Manners.

One of the great transcontinental railways has decided to open "a school of manners" for its employees. A need which has not been so clearly seen, nor yet supplied, is that of a "school of manners" for the corporations themselves. Not long ago a street railway company, which marks the stopping places of its cars by white posts, discontinued a stopping place that had been established for years. No notice was given to the public, nor was the white sign obliterated until some time after the change was made. People were merely left to discover the change by fruitless waiting. That was bad corporation manners. The withholding of news that the public has a right to know, as, for example, the cause and extent of delays to trains or the seriousness of an accident, is another piece of corporation courtesy that is exceedingly common.—*Youth's Companion*.

The Damage Claim Industry in Texas.

The *San Antonio (Tex.) Republic* of April 16 makes two vigorous editorial attacks on the "damage claim industry" which flourishes to such a notorious degree in Texas, but which, according to the *Republic*, finds its most nourishing soil in Bexar country, where San Antonio is situated. The *Republic* asserts that in a personal damage suit it is impossible for a corporation, and especially a public service corporation, to get justice in Bexar county, and it quotes the testimony of L. W. Earnest, claim agent of the San Antonio & Aransas Pass, in the recent trial of H. J. Cleary versus T. J. Freeman, receiver of the International & Great Northern. Mr. Earnest said: "Labor union influence and those affiliated with labor unions are responsible for much of the damage suit industry." He asserted that a combination exists whereby damage-suit lawyers have numerous "strikers" or "boosters" who drum up business for them, and that the railways cannot get representative juries for their cases in Bexar county. Frequently in damage suits he and attorneys for his road have made lists of jurymen who they believed attorneys for plaintiffs would object to and in almost every instance these names had been "scratched." "All you have got to do in this county," said Mr. Earnest, "is to get a crutch and walk down the street. You'll be stopped a dozen times in two blocks by some 'booster' recommending a firm of damage-suit lawyers." Mr. Earnest offered to give names of alleged "boosters" and "strikers," but the newspaper report says "he was not pressed to do so." In commenting on the situation, the *Republic* says:

"Friends and neighbors, better that San Antonio should be known as the headquarters of anarchists or the bloody black hand, than the chosen center where legitimately invested capital and the fruits of honest industry are confiscated under the forms of bastard laws. All Texas feels the evil effect of the iniquitous attacks upon corporate wealth by Bexar county juries, but more particularly and more damagingly does San Antonio. There must be a change, * * * through the repeal of the manifestly unjust class and pernicious laws that disgrace the statute books of Texas."

It is the duty and the interest of every citizen to lend his aid to the creation and promotion of a healthy public sentiment that shall demand a repeal or a material modification of the obnoxious laws."

Burlington Relief Department.

The last report of the relief department of the Chicago, Burlington & Quincy for the year ending December 31, 1909, includes a summary of its operations from the establishment of the bureau on June 1, 1889. The cash balance on December 31, 1908, was \$51,113. The receipts during the year were as follows: Net contributions of members, \$545,595; interest on monthly balance paid by the railway company, \$1,054; income from investments, \$20,625; total receipts, \$567,275. The cash balance at the end of 1908 and the receipts during 1909 made the total resources \$618,388. The benefits paid amounted to \$573,646, leaving a cash balance on December 31, 1909, of \$44,742. The receipts and benefits paid from June 1, 1889, to December 31, 1909, were as follows (cents omitted):

Net receipts from members.....	\$7,201,049
Bequests from deceased members.....	2,115
Deficiencies paid by railway company.....	42,532
Interest paid by railway company.....	138,405
Income from investments.....	132,343
	<hr/>
Benefits paid on account of sickness.....	\$3,212,035
Benefits paid on account of accident.....	3,763,130
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Receipts in excess of benefit orders paid.....	6,975,165
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The payments by the railway from its own funds in establishing, operating and maintaining the relief department from 1889 to 1909, inclusive, have been as follows:	
Expenses of establishing and operating, 1889 to to 1908, inclusive.....	\$1,206,304
Operating expenses, 1909.....	81,706
	<hr/>
Total operating expenses, 1889-1909.....	\$1,288,011
Deficiencies paid	42,532
	<hr/>
Total	\$1,330,544

In addition, the company has given, without charge, the time of officers and clerks in other departments of the service used in attending to relief department business, the service of the law department, the rent, care, heating and lighting of the offices of the department in Chicago and of all the medical examiners' offices owned by the company; also the use of express, mail, telephone, telegraph, transportation and other facilities. The value of these services and facilities is much greater than the cash paid by the company for the support of the department.

Railway Building in Arabia.

A party of French engineers are said to be making surveys for a line from the seaport of Hodeidah, Arabia, to Sana, the largest and most important inland city in southern Arabia, about 100 miles. The cost of constructing such a line would be great, as the route is through a mountainous section. It is understood that the engineers are to submit a plan of construction to the Turkish government at Constantinople by July, and that a concession to build the line will be given to the company that will build for the lowest price. It is understood that the competition will be limited to French companies, as French capitalists are supplying the money for the work.

Railway Building in Northern Syria.

With the concession already granted to the French company for an extension of its lines from Hama to Tripoli of Syria, which must be completed before two years from the date of the granting of the concession, it will be seen that an era of railway development has arrived that will completely revolutionize the whole commercial status of Northern Syria. At present all goods are transported in wagons, on camels, horses and donkeys, from the interior of the country to Aleppo, and the major portion thereof continues in the same manner to

the port of Alexandretta. The proposed railways will facilitate the transportation of grain, licorice root, wool, hides, cattle, sheep, etc., from the inland, and of cotton goods, manufactures, petroleum, sugar, etc., from the coast. This will very soon open up the vast uncultivated area along the Euphrates river, greatly increasing the output of products in general.

The Traveling Engineers' Association.

The eighteenth annual convention will be held at the Clifton hotel, Niagara Falls, Can., August 16-19, 1910. The following subjects will be discussed:

"Fuel Economy," under the following heads: (a) Value of present draft appliances. Can they be improved to effect fuel economy? (b) Firing practices, including the prevention of black smoke; (c) Roundhouse practices; whether it is more economical to knock or bank fires at terminals; d) Whether it is more economical to buy a cheap fuel of a low heat value, or a higher priced fuel of a greater heat value; (e) Devices and appliances for use on engines and tenders to prevent waste en route.

"Superheat as Applied to Locomotives."

"How Can the Traveling Engineer Best Educate the Present Day Fireman to Become the Successful Engineer of the Future?"

"Latest Developments in Air Brake Equipment and Its Effect on Train Handling."

"What Progress Has Been Made in Reducing the Cost of Locomotive Lubrication, and is it Advisable to Place this Item Entirely Under the Control of the Road Foreman or Traveling Engineer?"

"New Valve Gears as Compared with Stephenson or Link Motion, Referring Particularly to Economy of Operation and Maintenance and also Necessary Procedure in Case of Break-Downs."

Chicago Railway Club.

The annual election of the Chicago Railway Club will take place on May 14. A ticket has been nominated, which is headed by Charles G. Hall, general advertising agent, Chicago & North Western, for president, and George T. Gunnip, general agent passenger department, Atchison, Topeka & Santa Fe, for vice-president; C. Nyquist for secretary and treasurer; H. D. Howe, T. E. Waymen, E. P. Skene and F. A. Lehman, for directors. Plans for enlarging and improving the headquarters of the club at 112 Monroe street, Chicago, are under way, and it is expected that during the next year the club under the new officers will carry on active work along various lines.

Engineers' Society of Pennsylvania.

The second annual convention will be held in the House of Representatives, Pennsylvania State Capital building, Harrisburg, Pa., June 1-4, 1910. These conventions are organized and directed by this society, but all members of the engineering profession in Pennsylvania are invited to attend and take part in the discussions and business meetings.

Railway Clerks.

The International Brotherhood of Railway Clerks, at its conference in New Orleans last week, elected as president for the ensuing year J. J. Carrigan, of Memphis, Tenn. The next convention will be held in Boston in 1912.

Canadian Society of Civil Engineers.

At the meeting of the general section held on April 28 a paper entitled "Some Recent Developments in the Purification of Public Water Supplies" was read by R. S. Lea, M. Can. Soc. C.E.

MEETINGS AND CONVENTIONS.

The following list gives names of secretaries, dates of next or regular meetings, and places of meeting.

AIR BRAKE ASSOCIATION.—F. M. Nellis, 53 State St., Boston, Mass.; May 10-13; Indianapolis.

AMERICAN ASSOCIATION OF DEMURRAGE OFFICERS.—A. G. Thomason, Scranton, Pa.; June 7, 1910; Niagara Falls, Ont.

AMERICAN ASSOCIATION OF GENERAL PASSENGER AND TICKET AGENTS.—C. M. Burt, Boston, Mass.; next meeting, St. Paul, Minn.

AMERICAN ASSOC. OF LOCAL FREIGHT AGENTS' ASS'NS.—G. W. Dennis, Penna. Co., Toledo, Ohio.

AMERICAN ASS'N OF RAILROAD SUPERINTENDENTS.—O. G. Fetter, Carew Bldg., Cincinnati, Ohio; during first week in month.

AMERICAN INSTITUTE OF ELECTRICAL ENGINEERS.—R. W. Pope, 33 West 39th St., N. Y.; 2d Friday in month; New York.

AMERICAN RAILWAY ASSOCIATION.—W. F. Allen, 24 Park Place, New York; May 18; New York.

AMERICAN RAILWAY BRIDGE AND BUILDING ASSOCIATION.—C. A. Lichty, C. & N. W., Chicago; Oct. 18; Fort Worth, Tex.

AMERICAN RAILWAY ENGINEERING AND MAINT. OF WAY ASSOC.—E. H. Fritch, Monadnock Bldg., Chicago.

AMERICAN RAILWAY INDUSTRIAL ASSOCIATION.—G. L. Stewart, St. L. S. W. Ry., St. Louis; second Tuesday, May; Memphis, Tenn.

AMERICAN RAILWAY MASTER MECHANICS' ASSOCIATION.—J. W. Taylor, Old Colony Building, Chicago; June 20-22; Atlantic City.

AMERICAN RAILWAY TOOL FOREMEN'S ASSOCIATION.—O. T. Harroun, Bloomington, Ill.; July 12; Chicago.

AMERICAN SOCIETY FOR TESTING MATERIALS.—Prof. Edgar Marburg, Univ. of Pa., Philadelphia; June 28-July 2; Atlantic City.

AMERICAN SOCIETY OF CIVIL ENGINEERS.—C. W. Hunt, 220 W. 57th St., N. Y.; 1st and 3d Wed., except July and August; New York.

AMERICAN SOCIETY OF MECHANICAL ENGINEERS.—Calvin W. Rice, 29 W. 39th St., N. Y.; 2d Tues.; N. Y.; May 31-June 3; Atlantic City.

AMERICAN STREET AND INTERURBAN RAILWAY ASSOCIATION.—H. C. Bonecker, 29 W. 39th St., New York.

ASSOCIATION OF AM. RY. ACCOUNTING OFFICERS.—C. G. Phillips, 143 Dearborn St., Chicago; June 29, 1910; Colorado Springs.

ASSOCIATION OF RAILWAY CLAIM AGENTS.—E. H. Hemus, A., T. & S. F., Topeka, Kan.; May 25-27; Chattanooga, Tenn.

ASSOCIATION OF RAILWAY TELEGRAPH SUPERINTENDENTS.—P. W. Drew, Wis. Central Ry., Chicago; June 20-24, 1910; Los Angeles.

ASSOCIATION OF TRANSPORTATION AND CAR ACCOUNTING OFFICERS.—G. P. Conard, 24 Park Pl., N. Y.; June 21-22; Colorado Springs.

BUFFALO TRANSPORTATION CLUB.—J. N. Sells, Buffalo.

CANADIAN RAILWAY CLUB.—James Powell, Grand Trunk Ry., Montreal, Que.; 1st Tues. in month, except June, July and Aug.; Montreal.

CANADIAN SOCIETY OF CIVIL ENGINEERS.—Clement H. McLeod, Montreal, Que.; Thursdays; Montreal.

CAR FOREMAN'S ASSOCIATION OF CHICAGO.—Aaron Kline, 841 North 50th Court, Chicago; 2d Monday in month; Chicago.

CENTRAL RAILWAY CLUB.—H. D. Vought, 95 Liberty St., New York; 2d Friday in January, March, May, Sept. and Nov.; Buffalo.

ENGINEERS' SOCIETY OF PENNSYLVANIA.—E. R. Dasher, Box 704, Harrisburg, Pa.; June 1-; Harrisburg.

ENGINEERS' SOCIETY OF WESTERN PENNSYLVANIA.—E. K. Hiles, 803 Fulton Building, Pittsburgh; 1st and 3d Tuesdays; Pittsburgh.

FREIGHT CLAIM ASSOCIATION.—Warren P. Taylor, Rich., Fred. & Pot. R. R., Richmond, Va.; June 15, 1910; California.

GENERAL SUPERINTENDENTS' ASSOC. OF CHICAGO.—H. D. Judson, 209 Adams St., Chicago; Wednesday preceding 3d Thurs.; Chicago.

INTERNATIONAL MASTER BOILER MAKERS' ASSOCIATION.—Harry D. Vought, 95 Liberty St., N. Y.; May 24-27; Niagara Falls, Ont.

INTERNATIONAL RAILWAY CONGRESS.—Executive Committee, rue de Louval, 11, Brussels; July 4-16; Berne, Switzerland.

INTERNATIONAL RAILWAY FUEL ASSOCIATION.—D. B. Sebastian, La Salle St. Station, Chicago; May 23-26; Chicago.

INTERNATIONAL RAILWAY GENERAL FOREMEN'S ASSOCIATION.—L. H. Bryan, D. & I. R. Ry., Two Harbors, Minn.; May 3-7; Cincinnati.

INTERNATIONAL RAILWAY MASTER BLACKSMITHS' ASS'N.—A. L. Woodworth, Lima, Ohio; Aug. 16-18; Detroit, Mich.

IOWA RAILWAY CLUB.—W. B. Harrison, Union Station, Des Moines, Ia.; 2d Friday in month, except July and August; Des Moines.

MASTER CAR BUILDERS' ASSOCIATION.—J. W. Taylor, Old Colony Bldg., Chicago; June 15-17; Atlantic City.

NEW ENGLAND RAILROAD CLUB.—G. H. Frazier, 10 Oliver St., Boston, Mass., 2d Tues. in month, ex. June, July, Aug. and Sept.; Boston.

NEW YORK RAILROAD CLUB.—H. D. Vought, 95 Liberty St., New York; 3d Friday in month, except June, July and August; New York.

NORTH-WEST RAILWAY CLUB.—T. W. Flanagan, Soo Line, Minn.; 1st Tues. after 2d Mon., ex. June, July, August; St. Paul and Minn.

NORTHERN RAILWAY CLUB.—Fourth Saturday in month; Duluth, Minn.

OMAHA RAILWAY CLUB.—A. H. Christiansen, Barker Blk.; 2d Wed.

RAILLOAD CLUB OF KANSAS CITY.—C. Manlove, 1008 Walnut St., Kansas City.; Third Friday in month; Kansas City.

RAILWAY ASSOCIATION OF SPECIAL AGENTS AND POLICE OF U. S. AND CANADA.—May 10-13; Los Angeles, Cal.

RAILWAY CLUB OF PITTSBURGH.—J. D. Conway, Pittsburgh, Pa.; 4th Friday in month, except June, July and August; Pittsburgh.

RAILWAY SIGNAL ASSOCIATION.—C. C. Rosenberg, 12 North Linden St., Bethlehem, Pa.; annual meeting October 11-13, Atlantic City.

RAILWAY STOREKEEPERS' ASSOCIATION.—J. P. Murphy, Box C., Collinwood, Ohio; May 16-18; St. Louis.

RICHMOND RAILROAD CLUB.—F. O. Robinson; 2d Monday; Richmond.

ROADMASTERS' AND MAINTENANCE OF WAY ASSOCIATION.—Walter E. Emery, P. & P. U. Ry., Peoria, Ill.

SHORT LINE R. R. ASSOCIATION.—First Monday in month; New York.

ST. LOUIS RAILWAY CLUB.—B. W. Frauenthal, Union Station, St. Louis, Mo.; 2d Friday in month, except June, July and Aug.; St. Louis.

SOCIETY OF RAILWAY FINANCIAL OFFICERS.—C. Nyquist, 1134 La Salle St. Station, Chicago.

SOUTHERN ASSOCIATION OF CAR SERVICE OFFICERS.—E. W. Sandwich, A. & W. R. Ry., Montgomery, Ala.; annual Oct. 20; Atlanta.

SOUTHERN & SOUTHWESTERN R.R. CLUB.—A. J. Merrill, Prudential Bldg., Atlanta; 3d Thurs., Jan., Mar., July, Sept. and Nov.; Atlanta.

TRAFFIC CLUB OF NEW YORK.—C. A. Swope, 290 Broadway, New York; last Tuesday in month, except June, July and August; New York.

TRAVELING ENGINEERS' ASSOCIATION.—W. O. Thompson, N. Y. C. & H. R., East Buffalo; annual meeting, Aug. 16-19; Niagara Falls, Ont.

WESTERN CANADA RAILWAY CLUB.—W. H. Rosevear, P. O. Box 1707, Winnipeg; 2d Monday, except June, July and August; Winnipeg.

WESTERN SOCIETY OF ENGINEERS.—J. H. Warder, Monadnock Bldg., Chicago; Wednesdays, except July and August; Chicago.

Traffic News.

The New York Central is to run a Farmers' Special in the northern part of New York State in the week beginning May 9.

The Pennsylvania has made a reduction from \$2.40 a ton to \$1 a ton in the rate on cement from Philadelphia to Atlantic City, 56 miles.

"Facts for Farmers" is the title of a book which has been issued by the Delaware, Lackawanna & Western for free distribution. The author of the book is De Witt Carpenter, a farmer of Homer, N. Y., and it is endorsed by H. J. Webber, acting director of the New York State College of Agriculture, Cornell University.

The Morgan and Mallory steamship lines have made large reductions in rates on iron and steel articles from New York to Galveston. This action is said to have been occasioned by the advent of a new steamship line from Baltimore to Galveston, and this notwithstanding that, it is said, all of the vessels between New York and Texas are doing a heavy freight business.

President Tuttle of the Boston & Maine has announced that passenger rates will be advanced, probably June 1, except in the case of suburban rates, which will not be changed. The amount of the increase has not been announced, but it is expected that it will be about 10 per cent., so as to bring the rates back to the figure which prevailed before the general reduction in February, 1907.

The New York Assembly has passed and the Senate Judiciary Committee of New York has voted to support the bill of Assemblyman Parker increasing the powers of the New York Public Service Commissions, both First and Second districts, thus giving the New York City district commission the right to regulate the issue of transfers on street railway lines through a provision which gives both sections of the commission power to make joint through rates between electric railways.

The stocks of anthracite coal on hand at the present time are so large that there is, it is said, a good deal of price cutting by the coal operators who sell to the wholesalers. There has been some restriction of production, but it is said that this has not been sufficient as yet to produce any apparent effect on prices. The total production of anthracite in the year 1909 was 61,969,885 tons. For the last seven years the average production has been over 61 million tons, as compared with an average in the preceding seven years of less than 44½ million tons.

The Colorado & Southern, the Denver & Rio Grande, the Chicago, Burlington & Quincy and the Union Pacific have filed notice that they will appeal from a recent order of the Colorado Railway Commission requiring them to reduce their coal rates from Louisville, Colo., to Denver, and from Denver to Littleton. On the other hand, the Santa Fe has filed notice that it will not appeal from the commission's ruling requiring reductions in the rates from Denver to Littleton. The rate from Denver to Littleton had been \$1 and the commission ordered it reduced to not more than 50 cents.

Traffic Club of Chicago.

Friday evening, April 22, was "get together" night at the Traffic Club of Chicago. The first of a series of smokers was held and a Dutch lunch, supplemented by clay pipes and tobacco, was served. Entertainment was furnished by John A. Hand's orchestra; F. A. Butterworth, of the Pere Marquette; S. E. Kiser, of the Chicago Record-Herald, and Harry K. McEvoy, legerdemain artist.

Traffic Club of St. Louis.

The Traffic Club of St. Louis will entertain President Taft at a formal dinner at the Jefferson Hotel the evening of May 4 at 6:30. The dinner will be served at tables seating four, six and eight persons, and those desiring to attend or to make reservations of seats are requested to notify A. F. Versen, secretary-treasurer, as promptly as possible.

Car Surpluses and Shortages.

Arthur Hale, chairman of the committee on relations between railways of the American Railway Association, in presenting statistical bulletin No. 69, giving a summary of shortages and surpluses by groups from November 25, 1908, to April 13, 1910, says: "The change in conditions since our last bulletin is quite marked, the general suspension of coal shipments in several districts having resulted in an increase of 33,458 in the coal car surplus and the practical elimination of the slight shortage in this class. There was also an in-

crease of 4,693 in box car surplus and a decrease of 5,089 in the shortage of this class. The total surplus is 84,887, an increase of 39,215. The shortage totals 7,530, a decrease of 12,256."

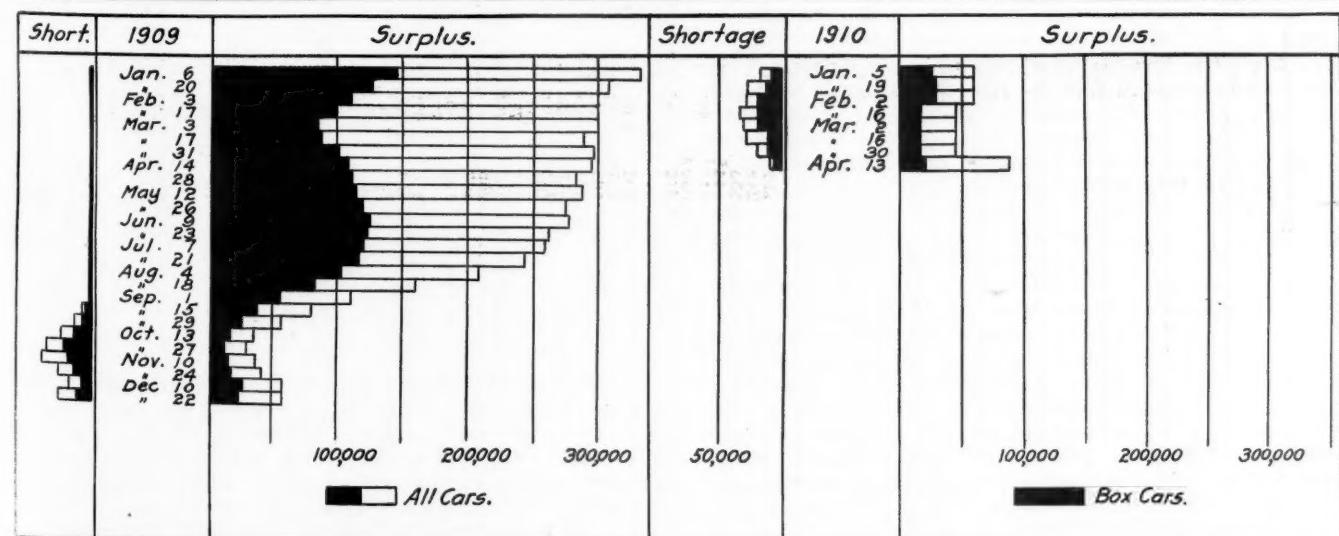
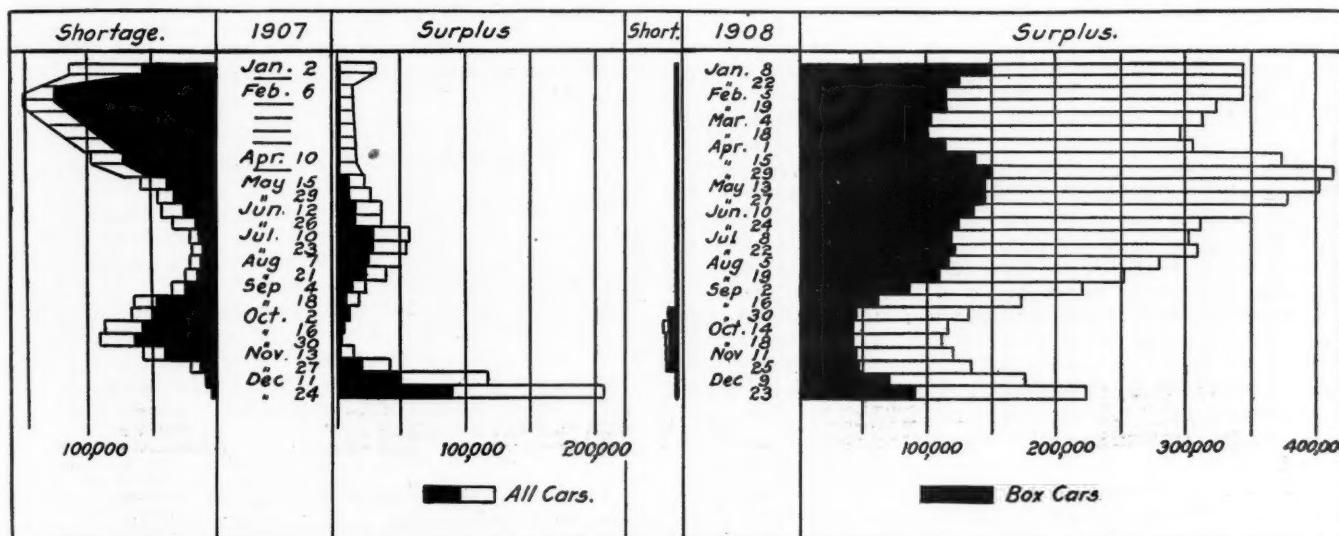
Southwestern Rate Case.

Commissioner Prouty, of the Interstate Commerce Commission, at Kansas City, Mo., on April 20 finished taking testimony in the case brought by the Southwestern Shippers'

CAR SURPLUSES AND SHORTAGES.

	Date.	Number of roads.	Surpluses.				Shortages.					
			Box.	Flat.	Coal, gondola and hopper.	Other kinds.	Total.	Box.	Flat.	Coal, gondola and hopper.		
Group #1—April	13, 1910	8	365	663	355	278	1,661	...	104	...	15	119
" 2 "	13, 1910	21	515	343	7,744	757	9,359	116	1	325	3	472
" 3 "	13, 1910	22	2,064	583	19,309	2,263	24,219	270	315	574	1,159	
" 4 "	13, 1910	10	1,113	2	240	978	2,433	1,319	329	912	100	2,660
" 5 "	13, 1910	18	1,840	72	1,049	999	3,960	278	370	127	...	775
" 6 "	13, 1910	20	7,689	166	5,780	5,017	18,652	1,055	64	11	241	1,371
" 7 "	13, 1910	2	427	109	527	421	1,484	...	...	...	...	198
" 8 "	13, 1910	12	860	50	2,968	1,288	5,166	103	74	14	7	198
" 9 "	13, 1910	9	578	183	202	643	1,606	...	...	...	91	91
" 10 "	13, 1910	18	3,701	1,006	2,536	5,525	12,768	189	39	17	9	254
" 11 "	13, 1910	6	1,375	691	48	1,465	3,579	391	...	...	40	431
Grand total		146	20,527	3,868	40,858	19,634	84,887	3,721	1,296	1,433	1,080	7,530

*Group 1 is composed of New England lines; Group 2—New York, New Jersey, Delaware, Maryland and Eastern Pennsylvania lines; Group 3—Ohio, Indiana, Michigan and Western Pennsylvania lines; Group 4—West Virginia, Virginia, North and South Carolina lines; Group 5—Kentucky, Tennessee, Mississippi, Alabama, Georgia and Florida lines; Group 6—Iowa, Illinois, Wisconsin, Minnesota and North and South Dakota lines; Group 7—Montana, Wyoming and Nebraska lines; Group 8—Kansas, Colorado, Missouri, Arkansas and Oklahoma lines; Group 9—Texas, Louisiana and New Mexico lines; Group 10—Oregon, Idaho, California and Arizona lines; and Group 11—Canadian lines.



Car Surpluses and Shortages in 1907, 1908, 1909 and 1910.

Traffic Association for reductions in freight rates from Atlantic seaboard territory via Galveston to points in Kansas, Oklahoma, Texas and Colorado. As has been stated in the *Railway Age Gazette*, the demand of the complainant was that rates should be made to points in the states mentioned which would be no higher than those made to points on the Missouri river. At present the rates to points west of the Missouri river, such as Oklahoma City and Wichita, are based on the Mississippi river combination, but are to some extent affected by the rates via Galveston, the rates to points north of Oklahoma City in Oklahoma and Kansas being in no case higher than those to Oklahoma City. The reductions sought would average about 30 per cent.

The theory of the complainants was that points such as Wichita and Oklahoma City should have rates as low as or lower than those to Kansas City because, as was contended, they were closer to water transportation—that is, were nearer the Gulf of Mexico than Kansas City. It was contended that six miles of transportation by water cost about the same as one mile of transportation by rail, and, figuring on this basis, it was sought to show that the constructive mileage from Galveston to Oklahoma City, for example, was only 900 miles, while the all-rail distance from New York to Kansas City is almost 1,500 miles.

The railways met the complainants on their own ground. S. H. Johnson, assistant freight traffic manager of the Rock Island lines, was their principal witness. It was shown that rates for water and rail hauls are usually divided by the water and rail lines, not on the basis of 6 to 1, but on the basis of 3 to 1, and it was contended that on the basis of constructive mileage Oklahoma City and points similarly situated, which are complaining that their rates are too high, really have more favorable rates than Kansas City has now. To begin with, Kansas City is only 458 miles from Lake Michigan, while Oklahoma City, for example, is 525 miles from the Gulf. Furthermore, a haul from New York to Kansas City via the Erie canal, the Great Lakes and the shortest rail line includes 1,391 miles by water and 458 miles by rail. Reducing this to constructive mileage by dividing the water distance by 3 and adding to it the rail haul makes a constructive mileage of 921 miles. On a lake and rail basis, the rail haul from New York to Lake Erie is 411 miles; thence by water to Chicago, 889 miles, and thence by rail to Kansas City, 458 miles. Reducing the water part of the haul to constructive rail mileage, makes the constructive mileage from New York to Kansas City 1,165 miles. The average rail distance between points in seaboard territory and New York is .306 miles. The ocean haul from New York to Galveston is 2,190 miles. The rail haul from Galveston to Oklahoma City is 525 miles. Reducing the water mileage to constructive rail mileage by dividing by 3, makes the constructive rail mileage from seaboard territory to Oklahoma City via Galveston 1,561 miles, or 396 miles more than the constructive mileage from New York to Kansas City via lake and rail, and 640 miles more than the constructive mileage from New York to Kansas City via canal, lake and rail. The density of the traffic moving from Kansas City to the East is also very much greater than that of the traffic moving from the East to Oklahoma City via Galveston. It was therefore contended that the rates to Oklahoma City and points similarly situated, are now relatively lower rather than relatively higher than those to Kansas City. The present first-class rate from New York to the Missouri river is \$1.47 and to Oklahoma City \$1.80.

The railways also sought to show that the existing rates from Atlantic seaboard territory via Galveston to Oklahoma City and also the local rates from Galveston to Oklahoma City are lower in proportion than those from St. Louis to Galveston. On the basis of three miles water to one mile rail, the constructive mileage from seaboard territory to Oklahoma City via Galveston, as already stated, is 1,561 miles, and the rail distance from St. Louis to Oklahoma City is 542 miles. The constructive mileage from seaboard territory to Oklahoma City is, therefore, 288 per cent. of the mileage from St. Louis to Oklahoma City. Even on the basis of four miles by water to one mile by rail, the constructive mileage from seaboard territory via Galveston to Oklahoma City is 1,378, or 256 per cent. of the mileage from St. Louis to Oklahoma City. While the mileage from seaboard territory to Oklahoma City is so much greater than that from St. Louis to Oklahoma City, the

commodity rates from seaboard territory to Oklahoma City are only 133 per cent. of those from St. Louis, and the class rates only 146 per cent. It was also shown that while there are about 120 commodity rates from St. Louis to Oklahoma City and only about 20 from Galveston to Oklahoma City, the commodity rates from Galveston embrace everything shipped out locally in large quantities by the manufacturers and importers of Galveston.

One of the points relied upon by the shippers was the contention that a reduction in rates from Galveston to points in Oklahoma, Kansas City, etc., could not help but benefit the railways because, as they asserted, there is an empty car movement northward from Galveston. The testimony on behalf of the railways showed, however, that on every railway except one the empty car movement is southward instead of northward, the preponderance of the northward traffic being due to the large amount of lumber shipped north, which exceeds the tonnage of grain hauled south. It was contended by Mr. Johnson (R. I.) that even if the empty car movement were northward the proposed reduction should not be required. He said that whether railways should reduce their rates to secure movement for empty cars should be left to the discretion of their traffic managers. If they could gain anything by doing so they would make the reduction voluntarily. The effect of the proposed reductions might be to cause a heavier movement of traffic northward from Galveston, but this, if it did result, would be due to diversion of traffic to this route, which otherwise would move by more direct routes and would, therefore, tend to cause an empty car movement elsewhere.

Various statements were introduced by the railways to show that they could not afford to make the reductions of rates demanded. One of these was prepared by H. U. Mudge, president of the Rock Island lines, and estimated that the cost of reproducing the Rock Island lines would be \$60,000 a mile, and that on this basis the net earnings of the road during the last fiscal year amounted to only about 3 per cent. on the value of its property.

Freight Car Balance and Performance.

Arthur Hale, chairman of the committee on relations between railways of the American Railway Association, in presenting statistical bulletin No. 68, covering car balance and performance for November, 1909, says:

"The surplus during November averaged 1.29 per cent. of the total equipment. There was a further reduction in the shop cars also, the average being 5.75 per cent., the lowest figure since January, 1908. Under these conditions, there was but little variation between the averages for all cars and those for active cars only."

	Average miles per day.		Average ton-miles per car per day.		Average earnings per car per day.	
	In. surp. cars.	Ex. surp. cars.	In. surp. cars.	Ex. surp. cars.	In. surp. cars.	Ex. surp. cars.
December, 1907	21.9	23.9	289	316	\$1.98	2.17
January, 1908	20.8	24.9	277	325	1.81	2.17
February, 1908	19.7	23.8	271	328	1.82	2.20
March, 1908	21.2	25.5	290	348	1.95	2.34
April, 1908	19.6	24.5	258	324	1.83	2.29
May, 1908	19.3	24.8	254	329	1.72	2.22
June, 1908	19.6	24.7	276	347	1.88	2.37
July, 1908	20.0	24.8	275	342	1.84	2.26
August, 1908	20.8	25.1	292	354	1.98	2.40
September, 1908	22.0	25.2	320	367	2.24	2.57
October, 1908	23.8	25.9	346	376	2.33	2.54
November, 1908	23.5	25.8	341	375	2.32	2.55
December, 1908	22.3	25.2	332	376	2.16	2.45
January, 1909	20.9	25.3	293	354	1.98	2.39
February, 1909	21.7	25.9	306	365	2.04	2.43
March, 1909	22.7	27.2	330	393	2.19	2.61
April, 1909	22.4	26.8	310	371	2.13	2.54
May, 1909	22.5	26.8	304	362	2.05	2.45
June, 1909	22.4	26.5	314	371	2.13	2.52
July, 1909	22.0	25.8	309	362	2.09	2.45
August, 1909	23.2	26.3	340	384	2.29	2.59
September, 1909	24.3	25.9	367	391	2.50	2.67
October, 1909	25.6	26.4	394	407	2.70	2.79
November, 1909	25.4	25.9	405	413	2.68	2.73

"The cars on their home lines averaged lower than at any time since June, 1907, being 57 per cent., or one point lower than the October, 1907, average. The loaded mileage, however, shows a falling off, the average being 71.2 per cent. as against 73.4 per cent. in October. This result taken in connection with a shifting of the group percentages would appear to indicate the beginning of an empty homeward movement of cars.

"The average miles per car per day held up well; the aver-

APRIL 29, 1910.

RAILWAY AGE GAZETTE.

	CAR BALANCES AND PERFORMANCES IN NOVEMBER, 1909.											
	Kansas, Colo.	Texas, Louisiana, Okahoma, Mo., Ark.	Oregon, Idaho, Nev., Cal., Ariz.	Montana, Wyo., Neb., Dakota., N. Mex.	Montana, Ky., Tenn., W. Va., No. and So. Carolina.	Iowa, Ill., Wis., Minn.	Montana, Wyo., Neb., Dakota., N. Mex.	Montana, Wyo., Neb., Dakota., N. Mex.	Montana, Wyo., Neb., Dakota., N. Mex.	Montana, Wyo., Neb., Dakota., N. Mex.	Montana, Wyo., Neb., Dakota., N. Mex.	Montana, Wyo., Neb., Dakota., N. Mex.
New York, Del. Md.	98,360	630,006	203,711	149,337	162,415	419,448	20,758	141,030	40,562	120,767	95,930	2,072,924 1,739
Ohio, Indiana, Mich.	22,967	.....	.....	.....	44,965	4,808	4,707	13,074	4,157	52	68	57
Excess	70	64	54	55	51	69	36	55	43	52	30	43
Per cent. cars on line to total owned:	60	41	41	34	34	43	48	103	148	104	98	100
Home	130	95	95	89	85	112	129	103	148	104	98	106,682
Foreign	3,216	40,971	9,738	2,865	6,761	17,107	2,278	9,734	2,376	8,752	2,881	2,179,806
All railroads	101,576	870,977	213,449	152,802	159,176	436,555	23,036	150,767	42,938	129,519	98,811	33,951
Private cars on line	3,84	5,59	6,89	6,71	8,00	3,90	4,52	9,98	4,93	6,88	4,17	64
Total, all cars on line	1,128	9,962	2,805	3,007	2,593	6,239	446	2,591	56	2,332	2,095	1,658,150,474
Per cent. of cars in shop	90	68	76	51	61	70	52	58	56	56	47	26,4
No. of freight engines owned	45,385,172	525,201,118	147,817,812	119,852,913	102,577,596	317,968,495	28,452,884	96,867,655	37,349,816	119,575,781	99,121,032	71,2
Av. cars on line per freight engine owned	14.9	25.7	23.1	26.1	25.3	24.4	41.2	22.4	28.9	30.8	33.4	212,404
Total freight-car mileage	74.3	68.8	73.3	70.4	74.6	72.8	76.4	70.2	69.0	71.9	74.2	140,365
Average miles per car per day	518,220,098	8,777,098,295	2,428,029,303	1,905,560,905	1,767,460,700	3,047,922,372	444,402,492	1,457,657,351	451,275,629	1,798,444,894	1,529,140,365	24,125
Per cent. loaded mileage	518,220,098	8,777,098,295	2,428,029,303	1,905,560,905	1,767,460,700	3,047,922,372	444,402,492	1,457,657,351	451,275,629	1,798,444,894	1,529,140,365	24,125
Ton-miles of freight, Inc. Co. freight	17.8	15.9	14.8	15.4	16.1	15.0	12.1	15.2	15.4	15.2	15.4	15.8
Average ton-miles, including Co. freight :	16.7	24.3	22.6	18.7	21.0	21.5	17.5	21.3	20.8	21.3	20.8	22.4
Per car-mile	15.4	430	426	416	373	381	337	350	468	516	405	405
Per loaded car-mile	17.0	51,328,836	\$14,624,883	\$11,951,383	\$12,242,982	\$24,902,564	\$3,817,354	\$12,415,488	\$4,374,104	\$16,863,207	\$9,741,842	\$168,196,570
Per car per day	\$5,933,926	\$2,62	\$2,58	\$2,27	\$2,37	\$2,30	\$2,87	\$3,04	5,30	\$3,32	\$4,84	\$2,83
Gross freight earnings	\$2,62	2.39	2.66	2.70	2.53	2.78	2.95	3.59	4.72	3.39	2.68	2.68
Average daily earnings : Per car owned	2.01	2.72	2.61	2.28	2.58	2.41	2.74	3.39	4.39	3.29	3.29	3.29
Per railroad-owned car on line	1.95	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
All cars on line .....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....

age of 25.4 was but two-tenths lower than the October figure. The average tons per loaded car set a new record of 22.4, one ton higher than the best average heretofore recorded.

"This loading resulted in the establishment of a new record for the ton-miles per car per day, which reached 405 for all cars and 413 for active cars, despite the decrease in miles per car per day and per cent. of loaded mileage.

"The average earnings per car on line is \$2.68, which while higher than the highest average previously recorded, i.e., that for October, 1907. This decrease under last month when taken in connection with the increased ton-mile per day figure indicates quite clearly that the traffic handled was made up of a larger proportion of the lower rated commodities. This is quite natural in view of the fact that October marks the close of the fall merchandise traffic and November the beginning of the winter business."

Correction should be made to figures included in Bulletin No. 66 for October, 1909, published in the *Railway Age Gazette* of April 15, 1910, page 1008, as follows: Ton-miles per car per day, Iowa, Ill., Wis., Minn., 291, should be 379. Grand total, 379, should be 394; same, excluding surplus cars, 407.

INTERSTATE COMMERCE COMMISSION.

Rate on Agricultural Implements from Chicago to Wisconsin Points..

International Harvester Co. of America v. Chicago, Milwaukee & St. Paul. Opinion by Commissioner Lane.

Complaint is dismissed because of incompleteness of recd. (18 I. C. C., 222.)

Rates on Horse Blankets.

Forest City Freight Bureau v. Ann Arbor Railroad et al. Opinion by Commissioner Clark.

Because of the diversity of goods shipped as horse blankets, no change will be ordered in the classification rating. (18 I. C. C., 205.)

Previous Ruling Reversed.

Marshall & Michel Grain Company v. St. Louis & San Francisco et al. Opinion by Commissioner Clark.

Previous report and order were based upon admission by defendants which, on further investigation, were found to have been inaccurate and incorrect. Previous order rescinded and new order in accord with the facts entered. (18 I. C. C., 228.)

Rates Found Not Unreasonable.

J. H. Wilson Saddlery Co. v. Chicago & Southern et al. Opinion by Commissioner Lane.

Claim for reparation on L.C.L. shipments of harness leather denied. (18 I. C. C., 220.)

Delray Salt Co. v. Detroit, Toledo & Ironton et al. (Original Petition.) Opinion by Commissioner Prouty.

Rate charged on shipments of salt from Detroit, Mich., to Memphis, Tenn., was the correct tariff rate. (18 I. C. C., 245.)

Failure to Post Supplement to Tariff.

Kiel Woodenware Co. v. Chicago, Milwaukee & St. Paul. Opinion by Chairman Knapp.

By supplement to its tariff defendant limited the application of a rate of \$2.50 per 1,000 ft. on logs from certain points to Kiel, Wis., to sawed logs 10 ft. or more in length, and by reason of failure to post said supplement as required by the act, complainant was not advised of the change in rate and on certain shipments of logs made by it the rate was corrected to 4 cents per 100 lbs. It is admitted that had complainant been informed of the change in rate, it could and would have sawed the logs in length to which the \$2.50

rate was applicable. The commission may award reparation in the amount of the difference between the rate exacted from complainant and the rate under which the traffic would have been forwarded had defendant not failed to post its tariff. (18 I. C. C., 242.)

Failure to State Conditions of Low Rate.

Southern Cotton Oil Co. v. Louisville & Nashville et al. Opinion by Commissioner Harlan.

The initial carrier having quoted a published rate on cotton linters, issued bills of lading showing that rate, but neglected to advise the complainant that it was applicable only on shipments moving under a released valuation, and charges were consequently collected at a higher rate. Under these circumstances the defendants had reasonable notice of the shipper's desire to have the benefit of the lower rate, and it was the duty of the defendants to have secured the shipper's signature to the released-valuation clause. Reparation awarded.

Cotton Goods Rates Unreasonable.

Louis Rosenblatt and Moses Rosenblatt, doing business under the firm name and style of H. Rosenblatt & Sons, v. Chicago & North Western et al. Opinion by Commissioner Harlan.

Through rates exacted on shipments of cotton drills, cotton-duck cloth, and overalls and jackets, from Wheeling, W. Va.; Cincinnati, Ohio, and Michigan City, Ind., to Beloit, Wis., exceeded the combinations on Chicago and are found unreasonable. Reparation awarded.

A shipment from Fort Wayne to Beloit described in the complaint and shipping papers as cotton piece goods, consisted of "triplex cloth," which is composed of cotton cloth and cotton shoddy, held together with a composition of rubber. The cotton-piece-goods rate was not legally applicable thereon, and until the complainant pays the lawfully published rate, the commission will express no conclusion as to the reasonableness of the rate or charges. (18 I. C. C., 261.)

Reparation Awarded.

William K. Noble v. Pittsburgh, Shreveport & Pacific et al. Opinion by Commissioner Clark.

Carload rate on coiled elm hoops from Tallulah, La., to Lime City, Tex., found unreasonable. (18 I. C. C., 224.)

G. W. Ryan v. Great Northern et al. Opinion by Commissioner Cockrell.

Through class rate in excess of combination of locals found unreasonable. (18 I. C. C., 226.)

Southern Timber & Land Co. v. Southern Pacific et al. Opinion by Commissioner Prouty.

Rate on hub blocks from Will's Point, Tex., to Stockton, Cal., found unreasonable. (18 I. C. C., 232.)

Glavin Grain Co. v. Chicago & North Western et al. Opinion by Chairman Knapp.

Carload rate on corn from Glidden, Iowa, to Chetek, Wis., found unreasonable. (18 I. C. C., 241.)

Platten Produce Co. v. Kalamazoo, Lake Shore & Chicago et al. Opinion by Commissioner Prouty.

Reparation awarded because of erroneous routing of shipments of grapes. (18 I. C. C., 249.)

Royal Metal Manufacturing Co. v. Chicago Great Western. Opinion by Chairman Knapp.

The evidence shows that complainant was overcharged and defendant should make reparation without an order. (18 I. C. C., 255.)

William Rotsted Co. v. Chicago & North Western. Opinion by Chairman Knapp.

Charges on mixed shipments of oats and flaxseed screenings in bulk found unreasonable. (18 I. C. C., 257.)

Delray Salt Co. v. Pennsylvania Railroad et al. Opinion by Commissioner Clements.

Present rate on rock salt from Cuylerville, N. Y., to Detroit, Mich., found unreasonable and lower rate prescribed. (18 I. C. C., 259.)

Alexander Sprunt & Son v. Seaboard Air Line. Opinion by Commissioner Harlan.

Finding that many of its through rates on cotton to Wilmington, N. C., exceeded the sum of its local rates on Columbia, S. C., the defendant made a general readjustment involving substantial increases, among other points, from North and Olar, S. C. Within six weeks the former rate from each point, which had been in effect for eight years or longer, was restored and subsequently remained in effect for nearly a year. Complainants having shipped cotton during the interval are awarded reparation on the basis of the restored rates. (18 I. C. C., 251.)

STATE COMMISSIONS.

The Railway Commission of Indiana is going to publish a monthly bulletin giving information about changes in rates affecting points in Indiana. The railways have been requested to include with new tariffs data concerning increases or decreases in which shippers in Indiana will be interested, and the monthly bulletin will be compiled from this information.

The Railroad Commission of Indiana has issued a circular on tender derailments. A circular on the subject was issued September 1, 1909, seeking to ascertain the causes of such accidents, but the information elicited was not satisfactory and another general investigation will be made. For a period of six months commencing May 1 the carriers are required to report every case of a tank derailment on main track, answering fully and definitely the questions propounded in a form furnished by the commission.

The New York State Public Service Commission, Second district, has issued an order requiring the International Railway, running electric cars between Buffalo and Lancaster, about ten miles, to refuse to carry short-distance passengers on these cars in the city of Buffalo, complaints having been made that these cars are crowded and are delayed seriously by stopping to take and leave passengers within the city of Buffalo. The order specifies the territorial limits within which the rule must be applied and the method to be adopted in giving it the necessary publicity.

The Railroad Commission of Indiana has issued a circular to all steam railways advising them that the condition of cars and engines in many of the yards "is practically as bad as it was three years ago." The commission therefore has directed its inspectors to make affidavits in all cases of penalty defects. If these affect state traffic the commission will commence suits for penalties in state courts; if the movement is interstate, the affidavit will be sent to the secretary of the Interstate Commerce Commission.

One of the large companies writes the commission as follows: "In common with other roads we have had no little trouble with the derailment of locomotive tenders, which was principally due to short wheel base and necessarily rigid construction of these tenders. We have increased the length and reduced the height of tenders, keeping the center of gravity as low as possible. They have been increased in length from 22 ft. to 28 ft., with wheel base of 24 ft. Reservoirs are fitted with longitudinal and lateral sheets to prevent oscillation of water. We have not entirely eliminated tender derailments but the long tenders have given no trouble in this respect."

COURT NEWS.

The New York State Court of Appeals, reversing the judgment of the Appellate Division of the Supreme Court, has sustained the constitutionality of the law of the state limiting to eight hours a day the working time of railway telegraphers. The decision was in a suit brought to recover a fine of \$100 against the Erie Railroad.

The United States Circuit Court of Appeals at St. Louis has rendered a decision allowing the Updike Grain Company, the Nebraska-Iowa Grain Company and the Crowell Lumber & Grain Company of Nebraska damages in the sums of \$6,310, \$1,613 and \$314, respectively, against the Union Pacific. These concerns allege that the Union Pacific discriminated against them by allowing the Peavey Grain Company three-quarters of a cent a bushel for elevating all grain consigned to it at

Omaha, Neb., when the grain was unloaded within 48 hours, while denying the same allowance to the complaining companies. The decision of the court of appeals upheld the decision of the lower court, but reduced the judgments. If the judgments allowed by it are not satisfactory to the litigants the cases are ordered remanded for a new trial.

Rejection of Tariff by Interstate Commission Does Not Make Rate It Contains Illegal.

Judge Morris L. Ritchie, of the Third Judicial District Court of Utah, has rendered a decision in the case of the Oregon Short Line versus the Consolidated Wagon & Machine Co., in which he makes the interesting and important ruling that the fact that a schedule of rates filed by a railway with the Interstate Commerce Commission is returned by the commission because, in the commission's opinion, it is defective, does not make the rates the schedule contains illegal and of no effect. Judge Ritchie holds that when it appears "that the schedule in question is actually received by the commission and ought to have been filed and was improperly rejected by it, it was in legal effect filed. * * * The receipt of a lawful schedule imposed upon the commission the duty of filing and that, in the eye of the law, that constituted a filing, is amply supported by the authorities."

The decision directly conflicts with the view seemingly taken by the commission that when, for any reason, it rejects a tariff this prevents the rates in the tariff from becoming effective. The facts in the case were as follows:

Certain shipments of hay were forwarded from Spencer, Idaho, to Yellowstone, Mont., the terminus of the Oregon Short Line's Yellowstone Park branch. The road's distance tariff applied on the portion of the line from Spencer to Warm River. Beyond Warm River the branch line was in the hands of the construction department. The only tariff carrying rates on that portion of the line had been rejected by the Interstate Commission because it carried on the title page the notation, "Shipments to be accepted only at convenience of construction department." The agent at Spencer quoted to the shipper a rate of 14 cents, which was arrived at by applying the distance tariff through from Spencer to Yellowstone. There was no authority for this, as the tariff filed with the Interstate Commission fixed a rate of 19 cents, which was the distance tariff rate from Spencer to Warm River plus the construction department's rate from Warm River to Yellowstone. The shipper paid only the 14-cent rate and the road sued it for \$152.78, being the difference between freight charges under the 14 and the 19-cent rates.

It was sought by the defendant to show the 19-cent rate was illegal by a deposition of Secretary Moseley, of the commission, stating that the tariff was rejected because it was in violation of the commission's special circular No. 6. The road, while admitting that the commission may regulate the form in which schedules are to be prepared, denied that such regulations can go further, and contended that so long as the rate itself is free from ambiguity and uncertainty and its application is affirmative and definite the commission has no power to make other requirements concerning it in any other respect. The court held that the powers of the commission and its officers and employees are to be construed just as strictly as are the rights and powers of the shipper or the public. The commission cannot enlarge or expand the provisions of the law to include powers thought desirable by it. The only uncertainty in the tariff was not as to what the rate was, but as to whether the construction department could accept freight from shippers. As the law did not give the commission power to reject tariffs for any such reason the court reached the conclusion "that it was beyond the power of the commission to reject the schedule for the sole reason that it contained the clause stated."

As is well known, the commission has made very strict and detailed regulations as to the way in which tariffs shall be printed and filed and has rejected many because, in various particulars, they did not meet with its requirements. Its course in this respect has been the subject of much criticism and complaint. The decision is important, as being the first, it is believed, in which this part of its power has been passed on, and it is not improbable the case will be appealed.

Railway Officers.

ELECTIONS AND APPOINTMENTS.

Executive, Financial and Legal Officers.

Sir William C. Van Horne, chairman of the board of the Canadian Pacific, at Montreal, Que., has resigned.

J. A. Hanley has been elected vice-president in charge of traffic of the Rock Island Southern, with office at Chicago.

Ogden Mills has been elected president of the Virginia & Truckee, with office at New York, succeeding D. O. Mills, deceased.

C. B. Heiserman, solicitor of the Sixth district of the Pennsylvania Lines West at Urbana, Ohio, has been appointed general solicitor, with office at Pittsburgh, Pa.

C. E. Benton has been appointed general attorney of the Missouri Pacific-Iron Mountain system, with office at Ft. Scott, Kan., succeeding J. H. Richards, resigned.

W. P. Wissmann has been appointed auditor of the Wisconsin & Michigan and the Lake Michigan Car Ferry Transportation Company, with office at Chicago, succeeding F. B. Huntington, resigned.

J. B. Sheean, general attorney of the Chicago, St. Paul, Minneapolis & Omaha at St. Paul, Minn., has been appointed general solicitor, with office at St. Paul, succeeding to the duties of Thomas Wilson, general counsel, deceased.

Gabriel Morton has been appointed secretary and assistant to the president of the Kanawha & Michigan, with office at Charleston, W. Va. W. J. Bienemann has been appointed auditor; E. N. Bennett has been appointed treasurer, and Norton Monsarrat has been appointed general attorney.

George K. Lowell has resigned as vice-president and general manager of the Ann Arbor Railroad and the Manistique & Lake Superior, with office at Detroit, Mich., to devote all of his time to the receivership of the Detroit, Toledo & Ironton. W. D. Holliday has been appointed assistant to the president of the Ann Arbor, in charge of all traffic. Joseph Goldbaum has been appointed auditor, with office at Detroit, and John T. Walsh has been appointed cashier.

The Alaska Northern having taken over the property of the Alaska Central, O. G. Larabee, receiver of the latter road, has been elected president, with office at Spokane, Wash., succeeding R. D. Miller. J. C. Williams has been elected vice-president and traffic manager. J. A. Haight, secretary and treasurer, has been elected secretary, with office at Seattle, Wash. F. G. Jennett has been elected treasurer and A. H. Wheatley has been elected assistant treasurer. See item under Railway Financial News.

Marshall M. Kirkman, vice-president in charge of accounts of the Chicago & North Western at Chicago, having resigned, Lewis A. Robinson, comptroller of the Chicago, St. Paul, Minneapolis & Omaha at St. Paul, Minn., has been appointed comptroller, with office at Chicago, and will assume the duties heretofore performed by Mr. Kirkman. Charles D. Brandriff has been appointed general auditor, reporting to the comptroller. Joseph B. Redfield, auditor, assistant secretary and assistant treasurer, having been assigned to other duties. Charles L. Lowe has been elected assistant secretary and assistant treasurer, with office at Chicago. Arthur B. Jones has been appointed local treasurer, and Harry L. Armstrong, assistant local treasurer, both with office at Chicago.

Operating Officers.

Paul Shoup has been appointed assistant general manager of the Southern Pacific electric lines, with office at San Francisco, Cal.

S. W. Parham, auditor of the Columbia, Newberry & Laurens, at Columbia, S. C., has been appointed also car accountant, succeeding F. J. Parham, resigned to go into other business.

W. M. Netherland, general storekeeper of the Southern Rail-

way at Washington, D. C., has been appointed assistant to general manager, with office at Washington, succeeding L. C. Ullrich, resigned.

W. J. Robertson, car accountant of the New York, Chicago & St. Louis, at Cleveland, Ohio, has been appointed superintendent of car service, and the position of car accountant has been abolished.

W. G. Howell has been appointed trainmaster of the Cleveland, Cincinnati, Chicago & St. Louis, with office at Riverside, Ohio, succeeding J. V. Kennedy, appointed superintendent of terminals at Cincinnati, Ohio.

W. J. Sullivan has been appointed chief train despatcher and division operator of the Birmingham sub-division of the St. Louis & San Francisco, with office at Birmingham, Ala., succeeding A. B. Woodward, resigned.

O. S. Keith, superintendent of transportation of the Illinois Central and the Indianapolis Southern at Chicago, having resigned, John M. Daly, car accountant, will assume the duties of both positions with the title of general superintendent of transportation.

A. T. Hollenbeck, whose appointment as superintendent of telegraph of the Chicago Great Western, with office at Chicago, has been announced in these columns, was born October 12, 1867, at Fairmount, Ill. He attended the common schools until 1882, and began railway work with the Chicago, St. Paul & Kansas City, now part of the Chicago Great Western, in February, 1890, as operator; he was then consecutively cashier, wire chief and manager up to 1893. Previous to 1890 he was for some time an operator for the North American Telegraph Company. In 1893 he was made chief clerk in the telegraph department, which position he held until his recent promotion.

O. Meadows has been appointed trainmaster of the First and Second districts on the Eastern division of the Western Pacific, with office at Winnemucca, Nev. The jurisdiction of F. L. Corwin, trainmaster at Elko, Nev., will hereafter include only the Third and Fourth districts of this division. S. J. Stewart has been appointed chief despatcher, with office at Elko, succeeding J. L. Perry, assigned to other duties.

Following the organization of the Northwest system of the Baltimore & Ohio, in charge of F. C. Batchelder as general superintendent of the lines west of Chicago Junction, Ohio, including the Baltimore & Ohio Chicago Terminal, T. W. Barrett, trainmaster at Garrett, Ind., has been appointed superintendent of the Chicago division, and J. M. Trimble, assistant trainmaster at Garrett, succeeds Mr. Barrett. The headquarters of the operating officers of the Chicago division have been transferred from Chicago to Garrett.

H. J. Merrick, superintendent of freight transportation of the Lake Shore & Michigan Southern, the Chicago, Indiana & Southern, the Lake Erie & Western and the Lake Erie, Alliance & Wheeling at Cleveland, Ohio, has been appointed general superintendent of freight transportation of all the New York Central Lines west of Buffalo. O. C. Smith, car accountant of the Lake Shore & Michigan Southern and the Lake Erie & Western at Cleveland, has been appointed superintendent of car service of the four roads mentioned above, with office at Cleveland. G. A. Codling, inspector of freight service of the Lake Shore and the Lake Erie & Western at Cleve-

land, has been appointed car accountant of the four roads mentioned, with office at Cleveland.

F. W. Egan, superintendent of the Western division of the Grand Trunk at Detroit, Mich., having been granted leave of absence, the following appointments have been made: J. Ehrke, assistant superintendent at Battle Creek, has been appointed acting superintendent, with office at Detroit; F. G. Bement, trainmaster at Durand, Mich., has been appointed trainmaster of the Twenty-fifth district, main line, and the Twenty-sixth district, with office at Battle Creek, and all reports previously made to the assistant superintendent will in future be made to the trainmaster. O. F. Clark, trainmaster at Pontiac, has been appointed trainmaster of the Twenty-fifth district (C. S. & M.), the Twenty-seventh, Twenty-eighth, Twenty-ninth districts, and the Pontiac, Oxford & Northern, with office at Durand.

Traffic Officers.

H. J. Hansen has been appointed a soliciting freight agent of the Mobile & Ohio, with office in Chicago.

Thomas F. Butler has been appointed general freight agent of the Ann Arbor Railroad, with office at Detroit, Mich., succeeding H. C. Bell.

J. W. Jones has been appointed a commercial agent of the Central of Georgia, with office at Memphis, Tenn., succeeding W. C. Kilgore, transferred.

James F. Taylor has been appointed a commercial agent of the Chicago, Milwaukee & St. Paul, in charge of business in Florida, with office at Tampa, Fla.

A. J. Dutcher, a traveling freight agent of the Harriman Lines, has been appointed general agent, with office at Atlanta, Ga., succeeding J. F. Van Rensselaer.

Guy C. Knickerbocker, passenger and freight agent of the Wabash at Lafayette, Ind., has been appointed traveling freight agent, with office at Toledo, Ohio.

J. F. Youse, general agent of the Hocking Valley at Toledo, Ohio, has been appointed general freight and passenger agent of the Kanawha & Michigan, with office at Charleston, W. Va.

F. A. Curry, commercial agent of the Lake Erie & Western at Buffalo, N. Y., has been appointed an industrial agent of the New York Central lines east of Buffalo, with office at New York.

S. MacClurkan, traveling freight agent of the St. Joseph & Grand Island at Chicago, has been appointed general agent, with office at Chicago, succeeding W. I. Laird, resigned to accept service elsewhere.

Edward Siegwald, traveling freight agent of the Norfolk & Western at Columbus, Ohio, has been appointed general freight and passenger agent of the Marietta, Columbus & Cleveland, with office at Marietta, Ohio.

A. F. Sullivan has been appointed a traveling freight agent of the Toledo, St. Louis & Western, the Chicago & Alton, the Minneapolis & St. Louis and the Iowa Central, with office at Minneapolis, Minn., succeeding O. L. Hill, resigned.

William Rieger has been appointed a traveling freight agent of the Toledo, St. Louis & Western, the Chicago & Alton, the Minneapolis & St. Louis and the Iowa Central, with office at New York, N. Y., succeeding G. Howard Hart, resigned.

Engineering and Rolling Stock Officers.

R. B. Darby, assistant engineer of motive power of the Lake Shore & Michigan Southern, at Cleveland, Ohio, has resigned, to go to the Pilliod Company, New York.

Charles Coleman, master mechanic of the Chicago & North Western at Eagle Grove, Iowa, has been appointed master mechanic, with office at Winona, Minn.

J. G. Hartley has been appointed supervisor on Division No. 6 of the Pennsylvania Railroad, with office at Williamsport, Pa., succeeding G. H. B. English, promoted.

R. D. Stewart has been appointed general superintendent and chief engineer of the Laramie, Hahns Peak & Pacific, with office at Laramie, Wyo., succeeding J. J. Argo, appointed locating engineer.

Morris K. Trumbull, engineer of track elevation for the city of Chicago, has been appointed principal assistant engi-



A. T. Hollenbeck.

neer of the Chicago & Western Indiana and the Belt Railway Company of Chicago, with office at Chicago.

L. G. Curtis, division engineer maintenance of way of the Chicago division of the Baltimore & Ohio at Chicago, has been appointed engineer maintenance of way of the recently organized Northwest system. E. D. Jackson, assistant engineer at Baltimore, Md., succeeds Mr. Curtis. (See item under Operating Officers.)

Lewis B. Rhodes, whose appointment as superintendent of motive power of the Virginian Railway, with office at Norfolk, Va., has been announced in these columns, was born in 1864 at Macon, Ga. Mr. Rhodes received his education in the high schools at Macon and began railway work in the latter part of 1880 on the Central of Georgia. He was later a machinist, and was then appointed foreman on the same road. In 1889 he left that company to go to the Georgia, Southern & Florida, since which time he has been consecutively to 1900 locomotive engineer, shop foreman, general foreman and foreman of locomotive repairs. He was appointed master



Lewis B. Rhodes.

mechanic on the same road in 1900, which position he held at the time of his recent appointment as superintendent of motive power of the Virginian Railway.

John B. Carothers, whose appointment as chief engineer maintenance of way of the Baltimore & Ohio Southwestern, with office at Cincinnati, Ohio, has been announced in these columns, was born February 26, 1863, at Cutler, Washington county, Indiana. He was educated at a normal university, and began railway work in 1888 as a rodman in a surveying party. From 1889 to 1891 he was with the Seattle, Lake Shore & Eastern and its successor, the Northern Pacific as a transitman. He was then for four years out of railway service, and in June, 1895, became an assistant engineer on the Baltimore & Ohio Southwestern at Cincinnati; a year later he was made division engineer on the Springfield division at Flora, Ill., where he remained until April, 1902, except for a year, when he was out of service on leave of absence. He was later division engineer on the Ohio division and also on the Indiana division. In February, 1904, he was made superintendent of the Ohio division at Chillicothe, Ohio, where he remained until November, 1905, when he was made superintendent of the Illinois division, with office at Washington, Ind., from which position he has just been promoted.



J. B. Carothers

Purchasing Officers.

J. F. Holzemer has been appointed purchasing agent of the Kanawha & Michigan, with office at Columbus, Ohio.

Railway Construction.

New Incorporations, Surveys, Etc.

ANADARKO & WESTERN.—Incorporated in Oklahoma with \$50,000 capital, to build a 50-mile line through Caddo county, Okla., at a cost of about \$1,000,000. The proposed route is from Alden, northwest via Anadarko to the Caddo-Grady county line, about 30 miles. The incorporators include: C. H. Deford, G. D. Driskell and W. F. McCracken, all of Anadarko.

ASHERTON & GULF.—This company, operating a 32-mile line from Asherton, Tex., to Asherton junction, is to be extended, it is said. The plans call for a line from Asherton, Dimmit county, west to Eagle Pass.

ATCHISON, TOPEKA & SANTA FE.—The directors have approved plans calling for an expenditure of \$31,000,000 during 1910 for improvements and new equipment. Of this \$12,000,000 is to complete work already authorized and under way, and \$19,000,000 is for new work. For double-tracking 123 miles west of Albuquerque, N. Mex., as a part of the double-track plan from Chicago to the Pacific coast, \$4,000,000 will be spent, \$2,000,000 for grade revision work between Galveston, Tex., and Coleman, and \$2,000,000 for a new double-track bridge over the Missouri river, south of Kansas City, Mo.

BALTIMORE & OHIO CHICAGO TERMINAL.—According to press reports about \$5,000,000 will be spent for improvements on this line, including elevating the tracks, building extensions, etc.

BANGOR & AROOSTOOK.—Work has been resumed on the extensions of this company's line in Aroostook county, Me.

BARTLETT-FLORENCE.—An officer is quoted as saying that financial arrangements have been made to build extensions as follows: From Florence, Tex., on the western end, northwest to Lampasas, about 25 miles, and another from Bartlett, southeast to a point near Houston, about 160 miles. (Dec. 17, p. 1212.)

BELLINGHAM EASTERN LOGGING & RAILWAY CO.—This company has been incorporated in the state of Washington, with \$10,000 capital and office at Bellingham, Wash. D. J. Cain, F. W. Bonness, Jr. and T. R. Walters are interested.

CANADIAN NORTHERN.—A contract for constructing the first section of 20 miles from Victoria, B. C., west towards Barclay sound, it is said, will be let within the next six weeks, and work is to be started in the near future on the Canadian Northern town site at Port Mann, on Vancouver island. It is expected that construction work will be started on the mainland from New Westminster about June 1. (April 1, p. 917.)

CANADIAN ROADS.—Application will be made to the Alberta legislature for a charter by J. Revillon, Edmonton, Alb., representing Revillon Brothers, Paris bankers, to build a line from Edmonton northwest via Sturgeon Lake to Grande prairie, on Peace river, 250 miles. The guarantee to be asked for by the company will not be as high as that given to the Alberta & Great Waterways.

CHICAGO & ALTON.—An officer is quoted as saying that double-tracking and grade reduction work is now under way between Bloomington, Ill., and Atlanta, 20 miles, as well as between Iles and Nilwood, 26 miles. With the completion of this work, which is to cost \$900,000, the company will have a double-track line from Chicago to Nilwood, 210 miles. Between Nilwood and St. Louis, Mo., there are several stretches of double-track, bringing the total up to 232 miles. The shop capacity is being enlarged at various places. Track revision work is now under way in Chicago and at Joliet. Subways are being built at Springfield, Bloomington, Normal and Jacksonville. New passenger stations are being put up at Lincoln and at Bloomington, and at Peoria a large new terminal is being built by a subsidiary company. At East St. Louis the Chicago & Alton's freight and engine terminal has been consolidated with the Toledo, St. Louis & Western. About 6,000 tons of rail will be used for double-tracking work and 9,000 tons for renewals. The Toledo, St. Louis & Western has just

finished work reducing the grade to 35 ft. to the mile at East St. Louis, going east to the Mississippi valley bottoms.

CHICAGO, BURLINGTON & QUINCY.—Under the name of the Paducah & Illinois it is planned to build a bridge across the Ohio river at Metropolis, Ill., and extend the line to Paducah, Ky., 12 miles up the river. Application has been made to the War Department for authority to bridge the stream.

CHICAGO, ROCK ISLAND & PACIFIC.—According to press reports, surveys are being made for a line from Mangum, Okla., south to Quanah, Tex., 45 miles.

CHICAGO SUBWAYS.—George W. Adams, incorporated, has submitted a plan for building a system of subways in Chicago at a cost of \$75,000,000. The question will be taken under consideration by the city council before June 1.

CINCINNATI, PORTSMOUTH, POMEROY & PITTSBURGH ELECTRIC.—An officer writes that plans and specifications will be ready in about 90 days. The company was organized to build an electric line from Cincinnati, Ohio, northeast to Pittsburgh, Pa. C. P. Sanborn, chief engineer, Huntington, W. Va.

COEUR D'ALENE & PEND D'OREILLE.—See Spokane International.

DETROIT, LANSING & GRAND RAPIDS (ELECTRIC).—An officer writes that surveys are being made and franchises have been granted for a line from Detroit, Mich., northwest to Grand Rapids, about 150 miles. It is probable that two lines will be built on the section between Eagle township and Lowell. Oliver H. Lau, president, and F. A. Bean, chief engineer, 706 Union Trust building, Detroit. (April 22, p. 1070.)

ELGIN, JOLIET & EASTERN.—An officer writes that second-track will be laid from Frankfort, Ill., east to Matteson, 7.5 miles, at a cost of \$90,000. The grading contract has been let to John Marsch, Chicago. Short sections of second-track will also be laid at Hartsdale, Ind., and at Dyer, at a total cost of about \$12,000. A grading contract for second-track work has been let to A. F. Hartigan & Co., Gary, Ind., on a section of 5.5 miles from Griffith, north to Ivanhoe Sand Pit, to cost \$83,000. The company is also planning to put up a 15-stall reinforced concrete engine house at Wankegan, Ill., a new 80-ft. turntable, coal chute, penstock, cinder pit, sand towers and a sand storage bin, to cost \$93,000, and is figuring on building a 17-stall reinforced concrete roundhouse at East Joliet, as well as a large cinder pit, to be served by a gantry crane, coal chutes, sand towers, sand storage bin, roundhouse, foreman's office with necessary track changes, to cost \$164,000. Plans are under way to enlarge the yards at East Joliet, at a cost of \$282,000. A six-stall reinforced concrete engine house is to be built at the mill yard of the Illinois Steel Co., Joliet works, together with a cinder pit, at an estimated cost of \$25,000. Bids will be asked for the reinforced concrete engine houses within the next two or three weeks. The masonry for maintenance of way renewals and second-track work will be carried out by the Newkirk & Powers Construction Co., Joliet. The railway company will do the track laying. (April 22, p. 1064.)

EVANSTVILLE, MT. CARMEL & NORTHERN.—Work is under way on the grading for the new single-track line from Mt. Carmel, Ill., to Evansville, Ind. Connection will be made with the Cairo division of the Cleveland, Cincinnati, Chicago & St. Louis at Mt. Carmel and with the Louisville & Nashville at Evansville. The excavation on the line includes 1,400,000 cu. yds. of earth, 125,000 cu. yds. of loose rock and 125,000 cu. yds. of solid rock, including about 250,000 cu. yds. of borrow to make necessary fills. About 1,150,000 cu. yds. of this work will be handled by steam shovels and the rest by teams. Concrete for abutments and piers will amount to about 20,000 cu. yds. The largest bridge on the line is over the Wabash river. It will have six 150-ft. fixed spans and a hand-operated swing span 235 ft. long, providing two 100-ft. clear channels. There will be 1,100 ft. of wooden pile trestle at each end of this bridge and three other trestles of 1,000 ft. each on the line. The Walsh Construction Co., Davenport, Iowa, has the general contract, which calls for the completion of the first section of the work from Mt. Carmel across the Wabash river by August 1, 1910, and the remainder by De-

cember 23, 1910. W. C. Johnson, division engineer, Evansville, Ind., is in charge of construction. (April 1, 1910.)

EVERETT & TACOMA.—This company has given a mortgage to secure an issue of \$5,000,000 of bonds. The funds are to be used for building an interurban line from Everett, Wash., south to Tacoma, about 65 miles. The company was incorporated about a year ago in the state of Washington with \$2,500,000 capital by G. M. Cochran, E. Colburn, E. Wright and O. E. Grossman, all of Snohomish.

GRAND TRUNK PACIFIC.—Funds are to be secured by the Grand Trunk Pacific Branch Lines Co. to carry out work on the following lines: Regina, Sask., southwesterly to the United States boundary, 155 miles; Regina west via Moose Jaw to various places, 110 miles; Bigger, Sask., in a southwesterly direction, 50 miles; Prince Albert branch, 110 miles, and on the Cut Knife branch, 50 miles, a total of 475 miles. These branch lines will be operated by the Grand Trunk Pacific and will form feeders for the main line of that company.

GREAT NORTHERN.—J. W. Stewart & Co., who were recently given a contract by the Vancouver, Victoria & Eastern for work between Princeton, B. C., and Abbotsford, have sublet a 21-mile section between Abbotsford and Chilliwack to the Martin Welch Co. Sub-contracts for the section from Chilliwack to Hope will be let soon. East of Hope mountain work is now under way on an 18-mile section between Princeton and Otter flat. (Jan. 21, p. 164.)

LAKE ARTHUR, JENNINGS & NORTHERN.—This company, which was organized last year in Louisiana, is said to have financial arrangements made to start work on a line from Jennings, La., north to Alexandria. B. B. Bliss, secretary; E. P. Fox, general manager, Jennings.

LAKE ERIE & PITTSBURGH.—An officer writes that this new line will probably be opened for business about June 1 from Mill Creek junction, near Cleveland, Ohio, southeast to the Cleveland & Pittsburgh connection near Ravenna, 27 miles. (Dec. 17, p. 1213.)

MINNEAPOLIS, ST. PAUL & SAULT STE. MARIE.—According to press reports, grading work has been started on the first section of the cut-off from New Richmond, Wis., to the St. Croix river. The work includes putting up a steel bridge over the St. Croix river and continuing the extension west to Withrow, Minn., in all 17 miles. Contracts are said to be let to Foley, Welch & Stewart, St. Paul, Minn. (March 18, p. 750.)

A contract is said to have been given to Fred A. Baxter, Superior, Wis., for grading the ore line and the yards between Mayline, south of Superior, and the dock site on St. Louis bay. The contract is valued at \$50,000.

An officer writes that a contract has been given to Foley, Welch & Stewart, St. Paul, Minn., for building a branch from Medford, N. Dak., west to Drake, about 135 miles.

NEW YORK, WESTCHESTER & BOSTON.—See Westchester Northern.

OREGON TRUNK LINE.—In addition to the work for which bids were asked April 18 contracts will be let soon, it is said, for building 40 miles to carry the line south to the north end of Klamath lake. (Jan. 28, p. 209.)

PADUCAH & ILLINOIS.—See Chicago, Burlington & Quincy.

PALACIOS, SAN ANTONIO & PECOS VALLEY.—An officer writes that the company was organized to build from Palacios, in Matagorda county, Tex., northwest via San Antonio, in Bexar county, to Pecos, in Reeves county, about 480 miles. The preliminary survey is expected to be finished this summer. No contracts have yet been let. There will be a roundhouse, some shops and terminal buildings. J. P. Pierce, president; H. W. Dean, secretary and manager, Palacios.

PHILADELPHIA, BETHLEHEM & NEW ENGLAND.—Incorporated in Pennsylvania, with \$250,000 capital, to build a 25-mile line from Nazareth, Pa., northwest to Durham Furnace. Charles M. Schwab is said to be the principal promoter.

ROME & NORTHERN.—Contracts will probably be let in May to build the extension of this road from Gore, Ga., northeast to Tunnel hill, 33 miles. H. M. Smith, chief engineer, Rome. (March 25, p. 850.)

ST. LOUIS SOUTHWESTERN.—According to press reports, this company has bought the property and rights of the Stephenville North & South Texas, operating a 43-mile line from Hamilton, Tex., north to Stephenville. An amendment to the charter of the S. N. & S. T. is said to have been filed, providing for the constructing of 93 miles as follows: From Hamilton, Tex., southeast to Gatesville, 32 miles; from Hamilton, northwest to Comanche, 35 miles, and from Stephenville, northwest to Thurber, 26 miles.

SCIO-LACOMB & JORDAN VALLEY.—Incorporated in Oregon, with \$50,000 capital and office at Scio, Ore. The plans call for a line from Munkers, in Linn county, east to Scio, thence to the Jordan valley. The incorporators include: A. G. Prill, E. C. Peery and C. Wesley.

SPOKANE INTERNATIONAL.—An officer writes that the Coeur d'Alene & Pend d'Oreille has been incorporated to build from the Spokane International at a point 25 miles east of Spokane, Wash., southeasterly to Coeur d'Alene City, Idaho. The work is to be started this coming summer. Maximum grades will be 1.4 per cent. and maximum curvature 10 degs. It has not been determined whether contracts will be let or the work carried out by the railway company with its own men. D. C. Corbin, president, and E. G. Taber, chief engineer, Spokane. (April 22, p. 1066.)

STEPHENVILLE NORTH & SOUTH TEXAS.—See St. Louis Southwestern.

TEMPLE & NORTHWESTERN.—Contracts are said to have been given to C. M. McConnico and to J. S. Moore, both of Lufkin, Tex., for grading work from Temple northwest to Hamilton, about 65 miles. The work is to be started at once. W. J. McDaniel, president; W. E. Dozier, engineer, Temple. (March 18, p. 751.)

TEXAS CENTRAL.—Work is now under way by Bucy & Burkhead on a section of about seven miles east of Rising Star, Tex. This is on the extension being built from DeLeon west to Rising Star. Col. C. H. Sharman, chief engineer, Rotan. (March 11, p. 547.)

TOLEDO, ST. LOUIS & WESTERN.—See Chicago & Alton.

UNION PACIFIC.—An officer is quoted as saying that second-track work has been finished from Omaha, Neb., west to Watson's ranch, about 201 miles, and 25 miles additional have been finished west towards North Platte. Work is being carried out to complete the section from North Platte west to Julesburg, Colo., about 80 miles, and to fill in the gaps between Watson's ranch and North Platte, about 75 miles. Similar work has been finished on the following sections: Cheyenne, Wyo., west to Buford, 20 miles; Lookout, west to Hanna, 40 miles; Rawlins, west to Wamsutter, 41 miles; Point of Rocks, west to Blairtown, 16 miles, and Green river, west to Granger, 30 miles.

VANCOUVER, VICTORIA & EASTERN.—See Great Northern.

WESTCHESTER NORTHERN.—A hearing is to be given on May 9 to consider the application of this company for a certificate of public convenience and necessity. The company is being organized by parties interested in the New York, Westchester & Boston to build from the terminus of that company's proposed line at White Plains, N. Y., north to Danbury, Conn., and Brewster, N. Y., about 45 miles. It is expected that contracts will be let for building the line as soon as the certificate is granted. (Dec. 17, p. 1214.)

WRIGHTSVILLE, ADRIAN & LYONS.—Organized in Georgia to build from Wrightsville, Ga., southeast to Lyons, about 40 miles, with a number of extensions. The route has not been definitely decided upon. T. J. James, president; W. F. Staten, secretary, both of Adrian; E. J. Sumner, treasurer, Wrightsville.

ZACATECAS & ORIENT.—Gustavo Madero, Monterey, Mex., representing the Madero interests, associated with the Franco-Espanol Bank of Paris, France, it is said, will build this line. The projected route is from Comacho, Zacatecas, Mex., on the Mexican Central, to the Mazipil mining district, with a branch to Bonanza, in all 250 miles. The government of the state of Zacatecas, it is said, guarantees 5 per cent. interest for a period of 20 years on the investment.

Railway Financial News.

ALASKA NORTHERN.—This company having taken over the property of the Alaska Central, the following have been elected directors: George Turner, R. D. Miller, O. G. Larabee, E. H. Morrison, F. W. Lowe, J. C. Williams and F. G. Jennett. See item under Railway Officers.

BALTIMORE & OHIO.—See Baltimore & Ohio Chicago Terminal.

BALTIMORE & OHIO CHICAGO TERMINAL.—The directors have authorized an issue of \$50,000,000 4½ per cent. 50-year bonds secured by a mortgage on the entire terminal property. About \$33,000,000 bonds are to be issued at once and turned over to the Baltimore & Ohio, to be held in its treasury. Of this amount, \$28,000,000 is to reimburse the Baltimore & Ohio for expenditures made in buying the property and \$5,000,000 is for improvements to be made to the terminal property.

G. F. Dominick, Jr., chairman of the Chicago Terminal Transfer minority stockholders' committee, says that litigation against the transfer of the property to the B. & O. is pending in the United States court and the suit is being pushed.

BOSTON & ALBANY.—This company has asked the Massachusetts railway commission for permission to issue \$2,000,000 4 per cent. 25-year bonds to reimburse the New York Central & Hudson River for additions and improvements.

CHICAGO & NORTH WESTERN.—W. A. Gardner, vice-president, in charge of operation, has been elected a director, succeeding H. McK. Twombly, deceased.

CHICAGO, MILWAUKEE & ST. PAUL.—*The Wall Street Journal* says that the directors of this company are expected very shortly to authorize an issue of bonds, probably about \$50,000,000, for extensions, equipment and improvements. It is said that the bonds are to be convertible into stock at par in about five years and are to be offered to stockholders at par.

CHICAGO, ROCK ISLAND & PACIFIC.—This company has sold to Speyer & Co., New York, \$1,714,000 first and refunding 4 per cent. bonds. Of the total amount sold by the company, \$220,000 refunding bonds were issued against an equal amount of Choctaw, Oklahoma & Gulf equipment trust certificates, which matured April 1, and \$1,494,000 were issued against an equal amount of Choctaw collateral 4 per cent. bonds, series H, which mature May 1. The entire issue of refunding bonds has been resold by the bankers.

HOCKING VALLEY.—See Kanawha & Michigan.

KANAWHA & MICHIGAN.—Suit has been filed against Nicholas Monsarrat, Charles H. Hickox and J. H. Hoyt by representatives of a minority stockholder of the Kanawha & Michigan charging conspiracy and misappropriation of funds during the time that the defendants were directors of the Hocking Valley and of the Kanawha & Michigan.

NEW YORK CENTRAL & HUDSON RIVER.—See Boston & Albany.

NEW YORK, PHILADELPHIA & NORFOLK.—The Virginia State Corporation Commission has approved an amendment to the charter of the N. Y. P. & N. giving the company power to increase its capital stock from \$2,500,000 to \$3,750,000. It is understood that the new stock will be issued as an extra dividend in lieu of preferred dividends which have been earned in recent years, but have been put into expenditures to the extent of \$1,250,000, it is said.

SAVANNAH, AUGUSTA & NORTHERN.—Judge Speer, in the United States court, has confirmed the sale of the road by the receiver to W. J. Oliver for \$250,000.

THIRD AVENUE (NEW YORK).—The receiver has come to an agreement with the city authorities as to past due franchise taxes, and has made a payment of \$1,000,000 on account, leaving \$665,000 still to be paid. The payment of \$1,000,000 was made from the proceeds of a sale of receiver's certificates.

Judge Lacombe has approved the deed transferring the property of the Third Avenue to the reorganization committee, which bought it at foreclosure sale March 1.

Supply Trade Section.

The National Car Coupler Co., Attica, Ind., is building two additions to its plant.

The Cleveland Twist Drill Co., Cleveland, O., will, on May 1, move its Chicago branch office to 9 North Jefferson street.

On April 26 the Chicago offices of the Q. & C. Co., New York, were moved to the new People's Gas building on Michigan boulevard.

The Commercial Acetylene Co., New York, will remove its western office on April 22 to the People's Gas building, Michigan avenue and Adams street, Chicago.

The Chicago Railway Equipment Co., Chicago, has moved its sales office from the Fisher building to the new McCormick building, Michigan avenue and Van Buren street.

The Blue Island Rolling Mill & Car Co., Chicago, will move its offices from the Fisher building to room 1020 McCormick building, Michigan avenue and Van Buren street.

The Consolidated Car Heating Company, Albany, N. Y., announces that on May 1 its New York office will be moved from 42 Broadway to the Singer tower, 149 Broadway.

The D. & A. Post Mold Co., Three Rivers, Mich., has orders for a 200-mold plant for the Delaware, Lackawanna & Western, and for two 60-mold plants for the Pennsylvania Lines.

The Dressel Railway Lamp Works, New York, will move its Chicago office on May 1 from the Western Union building to suite 1216 of the Peoples Gas building, 150 Michigan avenue.

Charles Conlisk, well known to many of the "old-time" supply men, died at his home at Stevens Point, Wisconsin, April 16. Mr. Conlisk was connected with William Sellers & Co., Inc., for a number of years, and retired some two years ago.

W. F. La Bonta, formerly purchasing agent of the Chesapeake & Ohio, has accepted a position as representative of the Union Spring & Manufacturing Co., Pittsburgh, Pa. Mr. La Bonta's headquarters will be in the American National Bank building, Richmond, Va.

James L. Norris, Jr., counsellor in patent causes and solicitor of American and foreign patents, F and Fifth streets, N. W., Washington, D. C., announces that he will continue the business of his father, who died March 5 last. Mr. Norris was associated with his father for seven years, and the business has actually been under the management of James L. Norris, Jr., since June, 1906.

Mason & Hanger, contractors for one of the siphon tunnels on the New York water supply extension, are installing in their plant at Cornwall, N. Y., two large Ingersoll-Rand Corliss duplex air compressors, with a capacity of 5,200 cu. ft. per minute. These contractors have also placed an order for a full equipment of Ingersoll-Rand rock drills, mountings, steels, etc., for the carrying on of their work.

Tom Brown, formerly master mechanic of the Juniata shops of the Pennsylvania Railroad at Altoona, and later connected with the Westinghouse interests, the American Car & Foundry Co. and E. Keeler & Co., has been appointed a special representative of the Westinghouse Air Brake Co., and is giving considerable attention to the draft gear question. Mr. Brown's headquarters are at 165 Broadway, New York City.

C. A. Nathan, chairman of the executive committee of the railway supply men exhibiting at the International Railway General Foreman's convention at Cincinnati, May 3-7, advises that about 150 companies are to be represented and that arrangements are completed for displaying the exhibits in the corridor of the Grand Hotel adjacent to the convention hall. S. P. Egan is chairman of the entertainment committee, and his plans include a varied program.

The Isthmian Canal Commission will receive bids until May 11 for locomotive cranes, inspection car, copper ladder rungs, wattmeters, chain blocks, lights, axes, adzes, machettes, scrubbing brushes, locks, hinges, gongs, vacuum gages, foot valves, cocks, iron and vitrified pipe fittings, brass chain, screws,

rivets, nails, hasps and staples, copper gaskets, grommets, small shop tools, saws, twist drills, corundum wheels, manila rope, rubber belting, insulating paper, chalk line, lumber, etc. (Circular 577.)

The Westinghouse Air Brake Co., Pittsburgh, Pa., announces that the decision of the United States Circuit Court of New York, holding its improved locomotive brake equipment to be an infringement upon the claims of the Corrington patent No. 762,282, has been reversed by the United States Circuit Court of Appeals by a unanimous decision, and that this court has upheld the contention of no infringement and the absolute invalidity of the patent in question and has ordered the bill against the Westinghouse company dismissed.

The Pressed Steel Car Co., Pittsburgh, Pa., is installing at its McKee's Rocks plant three 500-k.w. Westinghouse low-pressure steam turbines to utilize the exhaust from the large complement of non-condensing air compressors and direct-acting hydraulic pumps. In the electric power station, which is separate from the air compressor and pump house, there are installed a 1,000-k.w. Westinghouse low-pressure turbine and more than 1,500-k.w. capacity in high-pressure turbine apparatus. The McKee's Rocks plant furnishes electrical power to several mills in the vicinity of the Pressed Steel Car plant, and this energy is largely derived from the exhaust of the pumping and compressing apparatus, in some of which the steam is used non-expansively.

The Indian Refining Co., Cincinnati, Ohio, has recently established a railway lubricating department, which is the result of the company's increasing business with railways in connection with its contract work for rolling stock lubricating oils on a mileage guarantee basis. J. U. Smith, formerly with the Galena Signal Oil Co., Franklin, Pa., has been appointed manager of the railway lubricating department of the Indian Refining Co., with headquarters at the First National Bank building, Cincinnati. J. F. Gettrust and Floyd Davidson, formerly with the Galena Signal Oil Co., and T. U. Franklin, formerly purchasing agent of the Toledo & Western Traction Co., are associated with Mr. Smith. The company has branch offices in many large cities, with its general offices in Cincinnati.

R. B. Darby, formerly assistant engineer of motive power of the Lake Shore & Michigan Southern at Cleveland, Ohio, has accepted a position as mechanical engineer of the Pilliod Co., New York. Following his graduation from Purdue University in 1901, he entered the engineering department of the New York Central & Hudson River at West Albany, N. Y. In March, 1903, he went to the Gould Coupler Co., New York, and in the latter part of April of the same year he became mechanical engineer of the New York, Chicago & St. Louis, which position he resigned to become chief draftsman of the Pittsburgh & Lake Erie on August 1, 1904. On February 15, 1905, he entered the services of the Lake Shore & Michigan Southern, becoming chief draftsman on April 1, 1906, and in June, 1908, he was made assistant engineer of motive power, which position he has just resigned to become mechanical engineer of the Pilliod Co.

TRADE PUBLICATIONS.

Pressed Steel Brake Shoes.—The Pittsburgh Brake Shoe Co., Pittsburgh, Pa., has just issued a leaflet descriptive of its pressed steel brake shoes for freight cars.

Work Done.—Westinghouse, Church, Kerr & Co., New York, have just issued their pamphlet No. 4, which contains descriptions of a large amount of steam and electric railway construction which this company has handled.

Chloride Accumulator.—The Electric Storage Battery Co., Philadelphia, Pa., has issued bulletin No. 121 which contains a general description, with illustrations, of the installation of its chloride accumulator in mills of the Indiana Steel Co. at Gary, Ind.

Locomotive Fireboxes.—The Wm. H. Wood Loco Firebox & Tube Plate Co., Media, Pa., has just issued a pamphlet containing copies of a number of letters received from engineers and railway mechanical men regarding the firebox manufactured by this company.

G. A. R. Encampment.—The Lehigh Valley has issued a pamphlet containing a large amount of general information of interest to those expecting to attend the Forty-fourth National Encampment of the Grand Army of the Republic, to be held at Atlantic City, N. J., September 19-24, 1910.

Motorman's Valves.—The National Brake & Electric Co., Milwaukee, Wis., in bulletin No. 388 describes its national type motorman's valve and its motorman's valve with national type C sander valve attached. Both half-tone and line illustrations accompany a very complete description.

Linseed Oil and Enamel.—The Sterling Varnish Co., Pittsburgh, Pa., has just issued a catalogue descriptive of its raw refined linseed oil and black and clear iron enamels. A number of full-page half-tone illustrations show steel bridges, tank cars, factory buildings, etc., which have been painted with these products.

Branch Exchange Switchboards.—The Western Electric Co., New York, has just issued bulletin 1005, which is the third of a series of nine bulletins to be issued on telephone exchange apparatus. This bulletin describes the types of branch exchange equipments designed for use in business establishments, factories, etc.

Radial Trailing Truck.—The American Locomotive Co., New York, has just issued bulletin No. 1003 containing a description of this company's latest construction of radial trucks with outside bearings. This type of truck is particularly applicable to 4-6-2, 2-6-2, 2-8-2 and other types of locomotives, having two trailing wheels and more than four coupled driving wheels.

Denver & Rio Grande.—The passenger department of the Denver & Rio Grande is distributing a pamphlet entitled "Around the Circle," written by Edwin L. Sabin, after a trip of 1,000 miles through the Colorado Rockies. The Denver & Rio Grande has instituted these trips over two routes, both starting and ending at Denver, Colo., one being made entirely by rail and the other including a short trip by stage. The pamphlet gives full description of both tours with many illustrations.

Great Northern.—The Great Northern has issued a directory of theatres and public halls in the towns on its line. The towns are arranged alphabetically under the states and provinces and all information necessary for planning a theatrical tour is given. Another booklet just published by this company gives homeseekers fares to the Northwest with information about the train service and numerous photographs of the country traversed by the line. Still another folder describes the land in Chouteau county, Montana, which has just been restored to homestead entry by the government.

Hydraulic Jacks and Pressure Pumps.—Probably the most complete description of hydraulic jacks and pressure pumps ever issued in catalogue form is that of Richard Dudgeon, New York. This catalogue, No. 8, and of recent issue, contains 86 pages, 4½ in. x 7¼ in., of heavy glazed paper, which is necessary when using the high class illustrations with which the catalogue is well filled. Not only are descriptions of a wide range of jacks and pressure pumps given, along with tabulated specifications, sizes, capacities, etc., but also a large amount of valuable information on this general subject which is not to be found elsewhere in such available form.

RAILWAY STRUCTURES.

AMARILLO, TEX.—The new reinforced concrete steel combined passenger station and Harvey eating house, for the Eastern Railway of New Mexico has been opened for business. (Sept. 10, p. 480.)

AUGUSTA, GA.—An officer of the Georgia & Florida writes that work is now under way by the company's men putting up

a brick freight house in Augusta. The building will be 47 ft. x 358 ft., one story high, and cost \$25,000.

BLOOMINGTON, ILL.—See Chicago & Alton under Railway Construction.

DALLAS, TEX.—The Railroad Commission of Texas has again taken action in regard to the union station improvements to be made in Dallas. The commission has issued a new order requiring the railways entering Dallas to submit plans by July 1 for building two new union stations. It is proposed that one station shall be used by the Houston & Texas Central, the Texas & Pacific and the Texas & New Orleans, and the other by the Santa Fe, the St. Louis Southwestern, the Rock Island, the Trinity & Brazos Valley and the Missouri, Kansas & Texas. (Dec. 31, p. 1322.)

EAST JOLIET, ILL.—See Elgin, Joliet & Eastern under Railway Construction.

GARRETT, IND.—The Baltimore & Ohio is putting up an office building in Garrett.

INDIANAPOLIS, IND.—The Terre Haute, Indianapolis & Eastern Traction Co., according to press reports, will build a power station and car shop, which are made necessary by the purchase of the Indianapolis Traction & Terminal Co.

KANSAS CITY, Mo.—The Wabash is to rebuild and enlarge its freight station. Large platforms for handling automobiles will also be added. The total cost of the improvements will be about \$30,000.

See Atchison, Topeka & Santa Fe under Railway Construction.

LAKE SUPERIOR, ONT.—Bids are wanted by P. E. Ryan, secretary, Transcontinental Railway at Ottawa, Ont., May 2, for the construction of a station at Lake Superior. The work to be finished before September, 1910.

LINCOLN, ILL.—See Chicago & Alton under Railway Construction.

LINCOLN, NEB.—A fire in the yards of the Chicago, Burlington & Quincy on April 21 destroyed the old roundhouse, an ice house, a coal chute, 30 box cars and quantities of lumber. There were no locomotives in the roundhouse as the old building has been replaced by a new one, and there was nothing in the ice house except some cement being used for building work.

LIVINGSTON, TENN.—The Livingston Terminal Co., organized to build, own and operate terminal yards, has practically completed the necessary grading and work is now under way on an \$1,800 frame station. The total cost of the terminals will be about \$22,000.

MCADAM JUNCTION, N. B.—See Woodstock, N. B.

MINNEAPOLIS, MINN.—The Chicago, Milwaukee & St. Paul will demolish grain elevator B as well as a number of warehouses between Ninth and Tenth streets in Minneapolis, to make room for enlargement of its freight terminals.

NELSON, ILL.—The Chicago & North Western is building a new roundhouse and machine shop at a cost of about \$65,000.

NEW YORK.—The New York, Westchester & Boston is making plans to build stations at the following places: Morris Park, Pelham Parkway, Allerton avenue, Dyer avenue, Gunhill road and Baychester avenue, in the borough of the Bronx; South Third avenue, East Sixth street, Fulton avenue and Columbus avenue, in Mount Vernon; also at North Pelham; Pelhamwood; at Webster avenue and North avenue, in New Rochelle; Lincoln avenue, in Mount Vernon, and at North New Rochelle. It is probable that bids for the work will be asked for in the near future.

PEORIA, ILL.—See Chicago & Alton under Railway Construction.

PHILADELPHIA, PA.—Bids are in for a five-story brick and steel office building to be built at Ninth and Spring Garden streets in Philadelphia for the Philadelphia & Reading. The bids range from \$231,745 to \$263,245.

POCAHONTAS, ARK.—An officer of the St. Louis & San Francisco writes that work will be started before August, and

completed within two years, putting up a steel drawbridge, with a 280-ft. channel span, over the Black river at Pocahontas. The work is to cost \$100,000 and will be carried out entirely by the company's forces.

PORTLAND, ME.—It is said that the Boston & Maine will put up a 75-stall roundhouse at Thompson's point, in Portland.

QUEBEC, QUE.—An officer of the Quebec Railway, Light, Heat & Power Co., Ltd., writes that the company has bought a plot of ground, 74 ft. x 150 ft., at Crown and St. Joseph streets, centrally located in the city of Quebec. The ground is to be used as a site for an eight-story office building, to be of steel and tile or reinforced concrete construction. The improvements will cost about \$250,000. Work is to be started in May, removing the present buildings and excavating for the foundation. Contracts for the work have not yet been let.

According to press reports, bids are to be asked for building the Quebec bridge some time in May. (Dec. 17, p. 1218.)

RENOVO, PA.—The Pennsylvania Railroad has plans made for putting up a brick and steel boiler shop, 80 ft. x 250 ft., at Renovo, to cost about \$118,000. It is thought that bids for the work will be asked for in the near future.

ST. LOUIS, MO.—The Terminal R. R. Association of St. Louis is building a reinforced concrete stack for ventilating its tunnel, replacing a similar structure of steel. The new stack is 30 ft. in diameter and 126 ft. high above street level.

ST. STEPHEN, N. B.—See Woodstock, N. B.

SHIVELY, CAL.—Work is said to have been started by the Northwestern Pacific on a new terminal station at Shively.

TRUSCOTT, TEX.—The Kansas City, Mexico & Orient is locating a site in Truscott for a combined passenger and freight station, to be 24 ft. x 70 ft.

VANCOUVER, WASH.—An officer of the Spokane, Portland & Seattle writes that a car shop is to be built and the present machine shop is to be enlarged. Considerable work is to be done in filling trestles between Lyle, Wash., and Cooks Station, about 75 miles east of Portland; various small passenger stations are to be built and six or seven passing tracks will be laid.

WAUKEGAN, ILL.—See Elgin, Joliet & Eastern under Railway Construction.

WELLINGTON, KAN.—Plans have been approved for an addition to the Atchison, Topeka & Santa Fe roundhouse, which will give it a capacity of 28 stalls. It will be entirely rebuilt to conform to the company's standard for that class of buildings.

WOODSTOCK, N. B.—According to press reports, the Canadian Pacific will spend \$100,000 during the coming summer in improvements at various points along the Atlantic division. There is to be a new station at Woodstock, to cost \$20,000. At McAdam Junction a large addition is to be built to the station and hotel, and the terminal facilities at St. Stephen will be considerably extended.

Increasing Cost of Living in China.

In no other land has railway construction accomplished such changes as in China, and in no other country has it such a future. Wherever one travels in the interior the natives are found asking, Is the railway coming? or, When will it come? In the Loess country of central China the wagon roads are exceptionally bad, and as the bridges are never repaired there is steady deterioration in road communication, and a consequent steady increase in the cost of living. Along the Pekin-Hankow line the growth of prosperity is quite extraordinary. Around every station the settlements have extended, the houses are of a better type, and the inns, warehouses and coal yards have been greatly improved. Farmers within reach of the railways in regions that formerly grew enough only for their own needs can now sell their products in the great markets of Pekin in the north, and at Hankow on the Yang-tse. The Pekin-Hankow railway, although under inefficient control, is one of the most productive trunk lines in the world.—*Zion's Herald.*

Date News.

The items in this column were received after the classified departments were closed.

The Buda Company, New York, has moved its New York office from 26 Cortlandt street to room 716, No. 30 Church street.

E. S. Clapp has been appointed storekeeper of the Chicago & North Western, with office at Kaukauna, Wis., succeeding A. E. Johnson, promoted.

F. J. Angier, manager of the tie and timber department of the Chicago, Burlington & Quincy, at Galesburg, Ill., has resigned to go into other business.

The Pittsburgh & Lake Erie will take up its options on about 28 parcels of land in the village of Dickerson Run, Pa. The site will be used for a large yard.

J. W. Gerber has been appointed general storekeeper of the Southern Railway, with office at Washington, D. C., succeeding W. M. Netherland, promoted.

C. E. Thompson, purchasing agent of the Spokane, Portland & Seattle and the Astoria & Columbia River at Portland, Ore., has been appointed purchasing agent of the Idaho & Washington Northern, with office at Spirit Lake, Idaho.

Samuel Moody, assistant passenger traffic manager of the Pennsylvania Lines west of Pittsburgh, with office at Pittsburgh, Pa., has been appointed passenger traffic manager, succeeding E. A. Ford, retired on a pension. A sketch of Mr. Moody's railway life was published in our issue of March 11, page 544.

Louis Paulhan, during the afternoon and night of April 27-28, made the flight from London to Manchester, 183½ miles, in 12 hours and 12 minutes, which included the time consumed in stopping at Litchfield. This flight won the \$50,000 prize offered by the (London) *Daily Mail* for the first aviator who should fly from London to Manchester within 24 hours, with not more than two descents to the ground. The stop made by Paulhan was at Litchfield, which is 118 miles from London. Paulhan left London at 5:20 in the afternoon and arrived at Manchester at 5:32 Thursday morning.

An advance in freight rates has been made by all common carriers, to take effect June 1, on wool in the grease, via all rail and lake and rail routes, from St. Paul and Duluth to all Atlantic seaboard points. The general increase is 10 cents per 100 lbs., which, in some instances, means an advance of 25 per cent. These increases from present rates are made at principal points from Duluth and St. Paul: Albany, old rate 53 cents, new rate 63 cents; Baltimore, old rate 52, new rate 62; New York, old rate 55, new rate 65; Boston, old rate 60, new rate 70; Buffalo, old rate 37, new rate 47; Philadelphia, old rate 53, new rate 63; Newport News, old rate 52, new rate 62.

H. R. Safford having resigned as chief engineer maintenance of way of the Illinois Central and Indianapolis Southern to become vice-president of Edgar A. Allen & Co., Sheffield, Eng., that office is abolished, and L. W. Baldwin, division superintendent, of the Yazoo & Mississippi Valley at Greenville, Miss., has been appointed engineer maintenance of way, with office at Chicago. Lawrence A. Downs, assistant to chief engineer maintenance of way, has been appointed assistant engineer maintenance of way, with office at Chicago. D. J. Brumley, principal assistant engineer, has been appointed engineer of construction. L. W. Baldwin and D. J. Brumley report to A. S. Baldwin, chief engineer. J. J. Gaven, superintendent of the Tennessee division of the Illinois Central at Fulton, Ky., has had his jurisdiction extended to include the Birmingham division, succeeding Tracy L. Dubbs, appointed superintendent of the Yazoo & Mississippi Valley, to succeed L. W. Baldwin, promoted. The jurisdiction of J. G. Neudorfer, superintendent of the Mississippi division, has been extended to include the Jackson district and the Tennessee division with office at Water Valley, Miss. The jurisdiction of Thomas E. Hill, superintendent of the Louisiana division at McComb, Miss., has been extended to include the New Orleans division, with office at New Orleans, succeeding Oliver M. Dunn, assigned to other duties.

Equipment and Supplies.

LOCOMOTIVE BUILDING.

The Chicago, Indianapolis & Louisville is negotiating for six consolidation locomotives.

The Columbia & Puget Sound has ordered three locomotives from the American Locomotive Co.

The Norfolk & Western has ordered 10 class M-2 locomotives from the Baldwin Locomotive Works.

The National Railways of Mexico have ordered 14 Mallet locomotives from the Baldwin Locomotive Works.

The Valdosta, Moultrie & Western has ordered one ten-wheel locomotive from the Baldwin Locomotive Works.

The Louisville, Henderson & St. Louis has ordered two 10-wheel locomotives from the Baldwin Locomotive Works.

The Atchison, Topeka & Santa Fe has ordered 23 Atlantic, 12 Pacific and 10 Mallet locomotives from the Baldwin Locomotive Works.

The Boston & Maine, reported in the *Railway Age Gazette* of March 25 as being in the market for four Mallet locomotives, has ordered four 2-6-6-6 oil-burning Mallets from the American Locomotive Co., for delivery during September and October, 1910.

General Dimensions.

Weight on drivers	272,000 lbs.
Total weight	316,000 lbs.
Cylinders	22 in. and 35 in. x 30 in.
Diameter of drivers	61 "
Type of boiler	Extended wagon top; radial stay
Working steam pressure	.200 lbs.
Heating surface, tubes	4,448 sq. ft.
" " firebox	196 "
" " total	4,644 "
Tubes, number	406
" outside diameter	2 in.
" length	21 ft.
Firebox, type	Wide
" length	108 1/8 in.
" width	65 1/4 "
material and maker	Steel; Worth Bros.
Grate area	49.7 sq. ft.
Water capacity	7,500 gals.
Oil capacity	3,000 gals.

Special Equipment.

Axes	Carnegie steel
Boiler lagging	Ehret Mfg. Co., 85 per cent. magnesia
Brakes	Westinghouse-American, E. T. No. 6
Brake-beams	Diamond special
Brake-shoes	Am. Brake-Shoe & Fdy Co.
Brick arch	For oil burning
Couplers	Tower
Driving boxes	Hunt-Spiller gun iron
Headlight	Acetylene
Injector	Hancock composite, No. 11 x 11
Journal bearings	Hardy bronze
Oil burning system	Heintzelman, with Booth burner
Piston and valve-rod packings	United States
Safety valve	Ashton
Sanding devices	Hanlon
Sight-feed lubricators, 1 Detroit triple, 1 Detroit quadruple	
Springs	Railway Steel-Spring Co.
Staying	Bethlehem Steel Co.
Steam gages	American
Tires	Midvale
Tubes	Worth Bros.
Valve gear	Walschaert
Wheel centers	Steel

CAR BUILDING.

The Baltimore & Ohio is in the market for 120 passenger cars.

The Harriman Lines have ordered 424 passenger equipment cars from the Pullman Co.

The Columbia & Puget Sound is building 35 forty-ton coal cars at its Seattle, Wash., shops.

The Utah Light & Railway Co., Salt Lake City, Utah, is in the market for 12 city and 12 interurban electric cars.

The New York Central & Hudson River has ordered 1,000 steel hopper cars from the American Car & Foundry Co., and 1,000 general service cars from the Pressed Steel Car.

The Chicago, Burlington & Quincy has ordered 40 chair cars, eight dining cars and one club car from the Barney & Smith Car Co., and 10 chair cars from the American Car & Foundry Co.

The Kansas, Lawton & Gulf, a line incorporated in Oklahoma, is reported in the market for 10 flat, 10 box and five passenger cars. This item is unconfirmed. J. M. Bellamy, Lawton, Okla., is a director.

The Pennsylvania Lines East, reported in the *Railway Age Gazette* of April 1 as being in the market for passenger equipment, has ordered 60 P-70, 8 P-B-70, 15 M P-54 and 15 M P-54 B coaches from the American Car & Foundry Co.; 34 P-70 and 14 M P-54 coaches from the Standard Steel Car Co., and 25 M P-54 coaches from the Pullman Co., making a total of 171 steel coaches.

MACHINERY AND TOOLS.

The Pennsylvania has issued a short list of machine tools.

The New York Central has issued a list of machinery to cost about \$50,000.

The Ithmian Canal Commission is in the market for a number of small tools as noted in Supply Trade News. (Circular No. 577.)

The Pressed Steel Car Co., McKee's Rocks, Pa., is installing three 500-k.w., Westinghouse, low-pressure turbines to operate on the exhaust steam from the air compressors and hydraulic pumps.

The Illinois Steel Co., South Chicago, has ordered from the Standard Engineering Co., Ellwood City, Pa., an electrically-driven structural mill having five stands of 24-in. and three stands of 21-in. rolls.

IRON AND STEEL.

The Great Northern is in the market for 6,000 tons of bridge steel.

The Chicago Great Western is in the market for 5,000 tons of bridge steel.

The Lake Shore & Michigan Southern has ordered 12,000 tons of rails from the Lackawanna Steel Co.

The St. Louis, Brownsville & Mexico has ordered 2,000 tons of 80-lb. rails from the Pennsylvania Steel Co.

The Pittsburgh, Shawmut & Northern has ordered 6,500 tons of structural steel for a bridge over the Allegheny river near Freeport, Pa.

The National Brake & Electric Co., Milwaukee, Wis., has ordered 200 tons of structural steel from the American Bridge Co. It is to be used for an addition to the foundry.

General Conditions in Steel.—Although at the present time most of the steel mills are reported operating close to capacity, it is thought that this condition will not long continue, as orders for April are expected to show a falling off as compared with those of March. Reports indicate considerable cutting in prices of fabricated material, but that competition for new business has not caused shading to be general.

SIGNALING.

The New York, New Haven & Hartford is to erect automatic semaphore signals on the line between Middleboro, Mass., and Buzzard's Bay, 20 miles, double track. The arms of these signals will be pivoted near the center, like those which were put up two years ago on the line between Burnside, Conn., and Vernon, and which were described in the *Railroad Gazette* of January 17, 1908. Being pivoted midway of the length of the arm and the blade being below the fulcrum, the signal, when

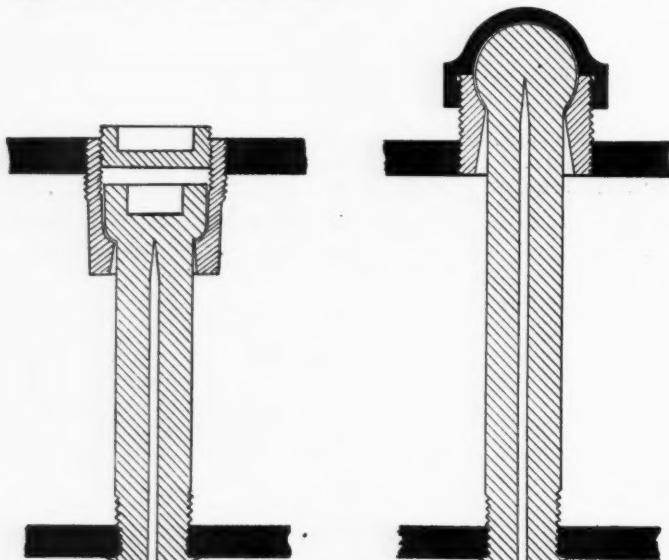
in the proceed position, has the appearance of being in the upper left-hand quadrant. As the reader will recall, numerous signals of this style are in use on the New York division of the New Haven road, where the signals are suspended from the overhead bridges which carry the high-tension electric wires used for the electric propulsion of trains, and the type has given entire satisfaction. No engineman has misunderstood them. Signals of this kind are also in use at a few points on the New Haven where most of the signals are of the ordinary lower left-hand quadrant style.

Tests of Harrington's Automatic Stop.

On Friday of last week members of the Block Signal and Train Control Board of the Interstate Commerce Commission made a series of tests of the automatic stops which are in use on the Northern Railroad of New Jersey between Jersey City and Englewood, N. J. These stops, installed by the inventor, S. H. Harrington, 120 Liberty street, New York City, have been in use on this road, which is a division of the Erie, for about two years. The essential feature of the device is a weight suspended high above the track in such a way that if it is passed when in the stop position it will strike a horizontal transverse lever fixed on the roof of the cab of the locomotive and, by moving that lever, open a valve and cause the application of the air-brakes throughout the train. As arranged on the Northern of New Jersey, the weight is suspended from a horizontal rod supported on the post of the distant signal. The clearing of the signal lifts the weight out of the engaging position. The weight consists of a short iron bar. It is suspended loosely by a chain and is of such size and weight as to cause the movement of the lever on the locomotive cab by its inertia alone, without being rigidly fastened to its support. The tests were entirely successful. The Signal Board has had inspectors watching these stops for several months, and during this time has made a large number of tests. These will be the subject of a report to be made by the Board.

Flexible Staybolts with Hollow Stems.

The accompanying drawings show a proposed application of hollow staybolt iron in the manufacture of Acme and Tate flexible staybolts. The hollow iron is closed and upset on the headed end in the same manner as if it were solid iron, which, apparently, it actually becomes.



Proposed Application of Hollow Iron to Acme and Tate Flexible Staybolts.

The hollow staybolt is especially valuable from the standpoint of self-inspection, as the fracture permits water to reach the channel and appear at both ends of the bolt. The flexible staybolt is designed for movable attachment to the outer and rigid attachment to the inner sheet. The movable con-

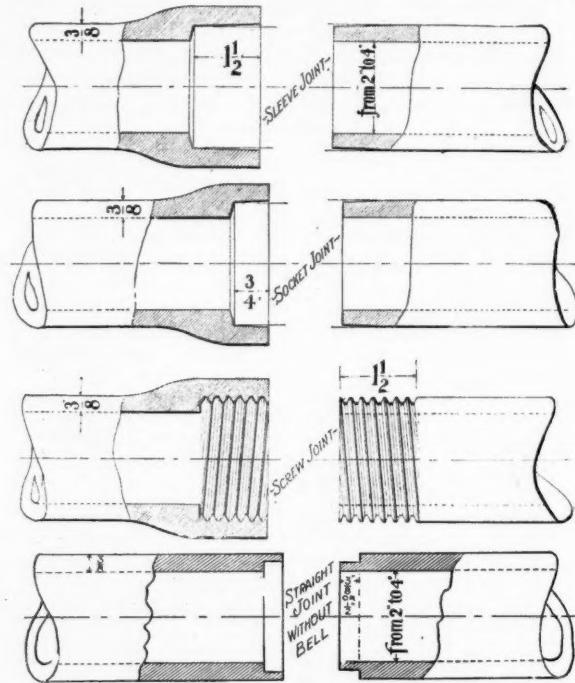
nexion permits the bolt to freely respond to the movements of the inner or fire sheet, due to expansion and contraction.

As it is impossible to detect broken flexible staybolts by the hammer sound on account of the head attachment, it is necessary to remove the caps to determine with complete assurance that a bolt is broken. This removal and subsequent replacing of the caps requires time, and to overcome these difficulties the hollow flexible staybolt is designed. There is, however, a question regarding the use of hollow iron in this connection on account of the fact that all the water which reaches the channel of the bolt will pass into the firebox rather than part of it going to the outside sheet, as is the case in hollow iron as used in an ordinary staybolt.

Conduit for Underground Cables.

A new cable conduit recently placed on the market by the H. W. Johns-Manville Co., New York, known as the J-M fiber conduit, is shown herewith. It is made of indurated fiber, a material used extensively for insulating purposes. The fiber is molded into shape under high temperature and pressure so as to be free from grain or laminations. This process gives each length of conduit a solid $\frac{3}{8}$ -in. one-piece homogeneous wall, with high tensile strength for light weight conduit.

The most interesting feature of this new conduit lies in the



Sectional Views of S-M Conduit Joints.

bell joints. One end of each section is molded to an enlarged size so as to be fitted to the joining section without any reduction in the wall thickness of either piece. This makes a very strong and rigid connection.

Installation methods in some instances necessitate the use of straight joints, and the manufacturers have also arranged to make this new conduit with straight joints, as shown in one of the illustrations herewith.

The inside wall joints of this conduit are smooth, being machine molded. Each length of conduit is also smooth throughout its bore, which greatly facilitates the work of inserting cables. The manufacturers claim that, by reason of their being no seams or roughness at the joints and as the air tight joints prevent particles of concrete from seeping through, a No. 6 wire can be pushed through each conduit from manhole to manhole without the use of ropes and rods.

Tests made of this conduit with $\frac{3}{8}$ -in. thickness of wall are said to show that it has an average puncture voltage of 40,800 dry and 33,000 volts after 40 hours immersion in water. A variety of fittings, such as bends, elbows, tees, etc., provide for all of the changes of direction in trenches. Two, three and four-way junction boxes are provided for branch and service connections.